Posttraumatic Growth: A Mediated-Moderation Model

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Abstract

The primary goal was to test a mediated-moderation model in which dispositional optimism was the moderator and its role was mediated by problem-focused coping. A secondary goal was to demonstrate that posttraumatic growth could be differentiated from maturation and normal development. Two groups of participants were recruited and completed questionnaires twice with a 60-day interval: One group (Trauma), described a traumatic experience and the second group (Non-trauma), described a significant experience. Contrary to the hypothesis, only problem-focused coping and deliberate rumination predicted posttraumatic growth, and these findings were only observed in concurrent analyses. Furthermore, the results indicated that there was no significant difference between groups on growth scores at either Time 1 or Time 2. The findings suggest that the term "posttraumatic growth" may refer to the *context* in which growth occurs rather than to some developmental process that uniquely follows trauma.

Keywords: posttraumatic growth, positive psychological growth, stress-related growth

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

Introduction

A national study found that 76% of the Canadians that were surveyed reported having experienced at least one traumatic event, and from these experiences, the lifetime prevalence for posttraumatic stress disorder (PTSD) was 9.2% (Van Ameringen, Mancini, Patterson, & Boyle, 2008). Given Statistics Canada (2011) reported there are 34 million residents in Canada, Van Ameringen et al.'s findings suggest that 3 million of these have experienced PTSD. However, there is evidence that trauma does not just lead to significant distress. In the last two decades, there has been a rapid increase in research findings suggesting that it is possible to not only overcome adversity, but also to grow as a result of positive psychological changes prompted by trauma (Prati & Pietrantoni, 2009; Tedeschi & Calhoun, 1995, 1996; Triplett, Tedeschi, Cann, Calhoun, & Reeve, 2012).

This study extended my prior work that considered the nature of posttraumatic growth and whether it was authentic or merely represented avoidance coping. In this study, I examined the relations of several variables to posttraumatic growth: challenged assumptive world (world beliefs or beliefs about the nature of the world), subjective severity of trauma, posttraumatic stress symptoms (avoidance, intrusive thoughts, and hyper-arousal), and most importantly, dispositional optimism and its associated coping styles, including deliberate rumination (intentional thoughts). As described in more detail below, I hypothesized that optimism would moderate the relations between posttraumatic growth and both distress and shattered world beliefs, and that positive coping styles would mediate these associations.

In order to understand posttraumatic growth, we need to place it in the broader context of trauma outcomes. Therefore, in this Introduction, I will first review the literature on trauma outcomes noting inconsistencies in the conceptualization of various post-trauma phenomena, and

will attempt to provide a more comprehensive and integrated description of trauma outcomes. I will then consider the risk and protective factors that have been found to be associated with positive and negative outcomes of trauma. Finally, I will focus on the phenomenon of posttraumatic growth, describe the processes found to be associated with it, as well as the variables that predict its development.

First, a review of the literature suggests there are three broad groups of outcomes following trauma that can be labeled (1) resilience and recovery (or lack thereof), (2) thriving, and (3) posttraumatic growth.

Types of Psychological Outcomes Following Trauma

The literature on trauma outcomes is characterized by conceptual inconsistencies and lacks integration. This situation is compounded by the fact that multiple terms exist to describe similar phenomenon. For example, the phenomenon that Tedeschi and Calhoun (1995, 1996) call posttraumatic growth has also been described as adversarial growth (Fortune, Richards, Griffiths, & Main, 2005), stress-related growth (LoSavio et al., 2011), and thriving (Carver, 1998). Conversely, it also happens that researchers use the same term to describe different phenomenon. For example, resilience has been conceptualized as the absence of symptoms (Carver; Hobfoll et al., 2009), having the ability to maintain functioning behaviour after a potentially traumatic experience (Bonanno, 2004; Bonanno, Papa, & O'Neill, 2001; Bonanno, Rennicke, & Dekel, 2005), a return to pre-trauma functioning (Segovia, Moore, Linnville, Hoyt, & Hain, 2012), and/or having the ability to engage in emotional regulation and self-efficacy (Reivich & Shatté, 2002).

This confusion in the field is particularly evident in Carver's (1998) oft cited theoretical paper on thriving. In it, he argues that *thriving* is a better term to describe the phenomenon of

posttraumatic growth; however, as described in more detail below, after careful examination of his argument, Carver is clearly describing a type of resilience, not posttraumatic growth.

Resilience and recovery. As noted above, there are differences in how resilience is conceptualized; however, studies of resilience and more generally of recovery following trauma, tend to share in common a focus on symptoms as the primary measure of outcome as noted by Bowman (1999), Brown, Kallivayalil, Mendelsohn, and Harvey (1996, 2007, 2012), and Herman (1992). When researchers use symptoms as the primary measure of outcome, they find that many people quickly return to pre-trauma levels of functioning and are apparently symptom free. For instance, the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) states that over half of trauma survivors will show complete recovery, as measured by symptoms, within 3 months following a traumatic experience. However, this focus on symptoms underestimates the widespread impact of trauma and oversimplifies the processes involved in recovering from traumatic experiences.

Specifically, Harvey (1996) argues that, following trauma, individuals can show substantial problems on a variety of dimensions of psychological functioning, such as relational capacities or emotional regulation (see also Brown et al., 2012; Chambers & Belicki, 1998; Harvey, 1996, 2007; Herman, 1992; Tedeschi & Calhoun, 1995, 2004). Moreover, Harvey (1996) disagrees with the clinical models that view resilience and recovery as *symptom abatement*, and emphasizes that resilience and recovery is not the absence of symptoms, nor is it global mental health. Instead, Harvey introduced a Multidimensional Recovery Model that describes seven distinct domains of psychological functioning that may be impacted by a traumatic experience: symptom mastery, affect tolerance, integration of memory with affect, control over memories, self-esteem, attachment, and meaning making.

Harvey (1996) acknowledges the obvious that symptoms are an issue; however, rather than focusing on symptom abatement, she views the relevant goal to be *symptom mastery*. For instance, individuals may need to learn how to cope with symptomatic arousal so that they are not overwhelmed and made dysfunctional by its presence. Similarly, *affect tolerance* can be influenced by trauma, and individuals need to regain the ability to regulate their emotions.

Trauma can also interrupt the *integration of memories with affect* (Harvey, 1996). A survivor must learn to recall the adverse experience and its associated affect in a more cohesive narrative. For example, some people remember the event, but not how it made them feel. Others will readily recall the emotion, yet have forgotten some or all of the details of what happened to them.

However, beyond symptoms and problems with managing extreme emotions, trauma can interfere with *control over memories* of the event (Harvey, 1996). Memories can be intrusive and occur unintentionally anywhere and at anytime. Furthermore, survivors may find it difficult to remember the traumatic event. Therefore, individuals need to regain control over when to recall, and not recall, the traumatic event.

Trauma can decrease *self-esteem* (Herman, 1992). Herman explains that many survivors feel in some way responsible for their traumatic experience—that if they would have done something differently, the event would not have happened to them. In addition, some survivors may believe that they are useless and, therefore, they deserve what happened to them. Therefore, people must work towards relinquishing any guilt and shame, and focus on building self-worth.

Trauma often has an adverse impact on relationships (Bonnano et al., 2005; Harvey, 1996; Taft, Watkins, Stafford, Street, & Monson, 2011). For example, Taft and colleagues conducted a meta-analysis using 31 empirical studies and found a significant relation between

trauma symptomatology and marital discord. Therefore, the sixth domain of psychological functioning identified by Harvey (1996) was *attachment*, in which individuals must restore their relational capacities.

Finally, survivors must be able to produce a coherent narrative about the traumatic event. This is accomplished by making sense of the adverse life experience, identifying whether there is any personal relevance, and integrating the event into personal beliefs about how the world works, a process called *meaning-making* (Harvey, 1996; Janoff-Bulman, 1989). Androutsopoulou, Thanopoulou, Economou, and Bafiti (2004) studied the extent to which adverse life experiences interfered with participants' ability to produce a consistent self-narrative. They found that those individuals who reported having psychological difficulties with their stressful life event produced confusing and contradictory responses. For example, one participant was asked where he saw himself in five years, and his response began with a pessimistic answer of "nowhere" followed by the random inclusion of his past suicidal tendencies. Androutsopoulou and colleagues also found that this participant was unable to acknowledge and integrate any emotion(s) that was associated with his adverse life event, even when directly asked to do so by the researchers. These findings support Harvey's (1996) contention that before survivors can make sense of, find meaning in, and produce coherent self-narratives about their adverse life experience, they must first regain control over certain domains of psychological functioning: the intensity of emotions and symptomatic arousal, and recalling the event and its associated emotions.

Harvey (1996) argues that traumatic experiences may not impact all seven domains; rather, some areas of psychological functioning can be left unscathed. Moreover, Harvey and others (Brown et al., 2012; Chambers & Belicki, 1998; Herman, 1992; Tedeschi & Calhoun,

1995, 2004) contend that resilience and pathology may coincide with individuals being functional in some aspect or domain(s) of their life, while dysfunctional in others. In summary, resilience and recovery are multidimensional and people can simultaneously function in one area, even while succumbing in another.

For instance, Brown et al. (2012) interviewed twenty patients that had previously experienced a traumatic event and were currently seeking treatment in an adult outpatient clinic. Each participant was interviewed for approximately ninety minutes, and narratives were transcribed by clinical and academic researchers. Brown and colleagues found that there was a general tendency for resilience to coexist with maladaptive behaviour(s). For example, one patient had reported working as a successful lawyer during the day, while being interpersonally dysfunctional in her personal life. Another participant reported being homeless and sleeping on heater grates while attending a prestigious university. Brown et al.'s data showed that the most commonly reported theme was that many of the outpatients described success with school or work, despite the co-occurrence of distressing emotions. These findings support the premise that individuals can be functional in carrying out day-to-day activities, while exhibiting dysfunctional behaviours in other domains. Measuring the full range of functional behaviour was beyond the scope of this study. Instead I measured post-traumatic symptoms, not because that is the common practice, but because of the documented relation of such symptoms to the focus of this study—posttraumatic growth (see below).

Thriving. Carver (1998) introduced a concept not well described in the literature -- a type of super resilience he called thriving: individuals who recover faster from subsequent traumas and do not experience the same magnitude of affect that they did during their first traumatic experience. As noted above, he described this as posttraumatic growth. However, as

shown below, posttraumatic growth is conceptualized by others quite differently and arguably should be considered a different form of trauma outcome. In addition, Carver's model does not incorporate the multiple facets of psychological functioning that can be disrupted after a traumatic experience, as discussed above. Rather, it is unidimensional consisting of symptom abatement and an associated return to pre-trauma baseline functioning. He does not take account of the fact that many individuals can function at their job and day-to-day activities while experiencing distress and dysfunction (as observed by Brown et al., 2012; Chambers & Belicki, 1998; Harvey, 1996, 2007; Herman, 1992; Tedeschi & Calhoun, 1996). Therefore, while Carver has made a valuable contribution in observing that some people develop a hardiness toward future trauma, more research is needed to establish whether this applies only to symptom mastery or to other areas of functioning affected by trauma. However, it is beyond the scope of this study to address this issue. Therefore, his concept of thriving will not be discussed further in this thesis.

Posttraumatic growth. Tedeschi and Calhoun (1995) coined the term posttraumatic growth to explain the development of positive psychological changes that (a) did not exist prior to an adverse life experience, (b) were not attributable to maturation or normal development, and (c) occurred after dealing with an extremely stressful situation. In attempts to show that posttraumatic growth is different from maturational growth, Tedeschi and Calhoun (1996) recruited 194 university students who completed measures of posttraumatic growth and prior trauma history. Specifically, the instructions on the growth measure simply asked participants to rate the changes that occurred within the last year. Based on the participants' reports on the trauma history questionnaire, their responses were categorized as a Trauma group if they had reported at least one traumatic experience within one year of the study, or a Non-Trauma group

if participants had not reported an adverse experience within the last year. The results showed that the Trauma group reported more growth in comparison to the Non-Trauma group. Specifically, the Trauma group showed higher scores in all but one domain of posttraumatic growth--spirituality.

As this is the only study that has included such a comparison group, these findings require replication. In addition, their study was entirely retrospective. Furthermore, as described in more detail below, Tedeschi and Calhoun (2004) argue that negative physical arousal is the distinctive factor between posttraumatic growth and maturation; however, they did not include measures of distress or anxiety. Therefore, this study extended Tedeschi and Calhoun's findings by including a comparison group of participants who had not experienced a traumatic event in their life, in addition to measuring distress (subjective rating of the stressfulness of their most significant experience in the prior two years and posttraumatic symptoms). In addition, data were collected at two points in time, separated by 60 days.

Tedeschi and Calhoun (1996) identified five distinct domains of growth that can occur because of dealing with highly stressful events: *appreciation of life, personal strength, relating to others, new possibilities, and spiritual change*. For instance, Zenmore and Shepel (1989) recruited 301 female participants who had been recently diagnosed with cancer and asked them to complete the Posttraumatic Growth Inventory (PTGI), a scale developed by Tedeschi and Calhoun (1996) to measure levels of positive psychological changes within the five domains of growth. The results showed an increase in the domain relating to others, in that 73% of the participants reported closer and more intimate relationships with their family members. More importantly, this newfound closeness was reported to be the most cherished life change that occurred as a result of the diagnosis.

Previous research findings have also shown positive relations between traumatic experiences and Tedeschi and Calhoun's (1996) second domain of growth, spirituality (Torabi & Seo, 2004). Torabi and Seo studied the psychological effects of the September 11, 2001 terrorist attack. Random digit dialing was used to contact 807 U.S. residents between the months of July and September 2002. Participants responded to 30 questions that were specific to the event of "9/11", their associated behavioural responses, and any identifiable life changes. The results showed that 24% of the participants reported an increase in one domain—spirituality.

A third domain in Tedeschi and Calhoun's (1996) model of growth is appreciation of life, wherein individuals have a newfound respect for their existence. Widows, Jacobsen, Booth-Jones, and Fields (2005) conducted a study with post-surgery bone marrow transplant patients and found that they grew in all of the areas, but especially in the domain of appreciation for life with 90% of the participants reporting this change. More specifically, the data suggested that the life threatening surgery prompted survivors to recognize and fully appreciate what was important in their life.

Tedeschi and Calhoun's (1996) factor analysis on posttraumatic growth also identified new possibilities and personal strength as the last two domains of growth. New possibilities refer to the development of new interests, and/or making changes to a life path. For example, psychologists, Yalom and Lieberman (1991) described psychotherapy with a client named Ashley F, whose husband had been murdered during a robbery. Several months after the traumatic event, Ashley found that she had developed a desire for helping other individuals who had been subjected to severe emotional pain. She moved forward with her life by helping to develop, and become, an active leader in support groups for parents with lesbian and gay children. Ashley explained that these positive changes in her life path were the result of her own

traumatic experience, and that she sought out opportunities that would allow her to help other emotionally distressed people.

Lastly, the domain of personal strength refers to having the perception that one has the courage and ability to overcome adversity, similar to Bandura's (1991) conception of self-efficacy. For instance, Kleim and Ehlers (2009) studied the effects of stressful life events with 180 survivors of various forms of assault. They found that, in addition to changes in appreciation of life, more than half of the participants reported positive psychological changes in the domain of personal strength.

It is noteworthy that in these studies, participants were shown to grow in some, but not all areas of posttraumatic growth. Therefore, posttraumatic growth, like resilience and recovery, refers to multiple, at least somewhat independent areas of growth. While it is beyond the scope of this study, more research is needed to study the separate predictors that elicit the different types of growth. However, we will measure growth in the five different domains as identified by Tedeschi and Calhoun (1996).

There is continued debate on whether posttraumatic growth is only an illusion, a maladaptive coping strategy of avoidance (McFarland & Alvaro, 2000), or if it is in fact authentic (as argued by Maercker & Zoellner, 2004; Tedeschi & Calhoun, 1996, 2004; Zoellner & Maercker, 2006). This debate is fuelled by the repeated findings of a significant positive association between post-trauma symptoms and growth (Brown et al., 2012; Pietrzak et al., 2010; Tedeschi & Calhoun, 1995; Triplett et al., 2012). For example, Pietrzak et al. recruited 272 veterans from Operation Freedom and found a significantly positive association between posttraumatic growth and posttraumatic stress symptoms. Because of the tendency, as discussed above, to think of trauma outcome as unidimensional and consisting solely of symptom

abatement, the assumption is made by some researchers that if ratings of posttraumatic growth correlate with posttraumatic symptoms, then posttraumatic growth must in fact be a symptom (or a factor that exacerbates symptoms). Given avoidance of the negative emotion and thoughts associated with trauma is one of the key symptoms of PTSD, it is a natural conclusion that imagining one's self to be growing as a consequence of trauma is a convenient fiction designed to distract from the realities of trauma impact.

Tedeschi and Calhoun (2004) addressed this debate about the correlation between growth and distress by arguing that the PTGI is not a measure of global well-being or the absence of symptoms. Rather, it is a measure of the extent to which survivor's view their post-trauma outcome(s) as positive, not how desirable they view the event in and of itself. Identifying positive psychological changes as a result of an adverse experience does not necessarily distract a person from the negative emotions associated with experiencing a devastating event. For example, Best, Streisand, Katania, and Kazak (2001) conducted a study with 67 families that had a child who was previously diagnosed with leukemia and found a positive association between posttraumatic growth and anxiety, despite the fact that their child had been in recovery for an average of 3.7 years. The parents had reported that seeing other children who looked sick elicited anxiety, which suggests that the emotions associated with a traumatic experience are not erased when survivors identify positive changes within a certain area of their life.

Herman (1992) argued that traumatic events leave an everlasting imprint on one's mind, soul, and spirit, and that everyday life events can evoke the stress and anxiety that was associated with a past traumatic experience. For example, the birth of a first child or even a wedding day may elicit negative emotions that were associated with remembering the loss of one's parent(s).

Therefore, posttraumatic growth is arguably not a "symptom" of a traumatic experience, rather it is an "outcome" that occurs from coping and finding meaning from an adverse life experience.

In addition, there is evidence that argues against growth being simply avoidance. Specifically, posttraumatic growth has been repeatedly shown to be associated with deliberate rumination, which is antithetical to avoidance (Cann et al., 2011; Tedeschi & Calhoun 1995, 1996; Triplett et al., 2012). Furthermore, the psychological changes that are documented seem to go beyond simple avoidance. For instance, Siegel and Schrimshaw (2000) conducted a study with fifty-four women who were diagnosed with HIV/AIDS and found that more than half of them reported positive psychological changes as a result of finding meaning from their diagnosis. Prior to their illness, many participants reported drug-use, no life goals, and no education. However, despite the immense stress of the diagnosis, participants developed positive changes in the domains of new possibilities and appreciation for life. These changes motivated participants to acquire an education so that they could provide counselling services to others who had also been diagnosed with HIV/AIDS.

It is difficult to conceive of such changes as simply being avoidant coping. With that said, Maercker and Zoellner (2004; Zoellner & Maercker, 2006), Taylor (1983), and Hobfoll et al. (2007) have argued that immediately following a traumatic event, people may experience something like posttraumatic growth that is in fact illusory, but in the short term is adaptive. Such illusory growth can serve as a temporary adaptive coping strategy by providing short-term benefits, for instance, serving as a distraction from post-trauma distress and thereby sustaining the ability to maintain functional day-to-day behaviour. However, such self-deceptive illusions of growth will have adverse long-term consequences unless followed-up with constructive behaviours, such as emotion-regulation, deliberate rumination, and practical problem-solving

(Bonanno et al., 2005). Otherwise, survivors can regress to maladaptive behaviour(s), such as emotional flooding and the inability to maintain interpersonal relationships (Hobfoll et al., 2007; Maercker & Zoellner, 2004; Taylor, 1983; Zoellner & Maercker, 2006).

For instance, Suls and Fletcher (1985) conducted a meta-analysis using forty-three studies that focused on coping strategies and found that over time, avoidant behaviour was associated with poor adaptation to the reported life stressor. Therefore, while avoidant behaviour(s), which can include illusions of posttraumatic growth, may provide temporary relief from the psychological and physical effects of a traumatic event, the long-term consequences can be debilitating (Hobfoll et al., 2007; Taylor, 1983).

Zoellner and Maercker (2006) introduced a Two-Component Model of posttraumatic growth in an attempt to integrate the discrepancies in the literature on the authenticity of posttraumatic growth. There are two constituent parts of the model, an illusory growth component and an authentic growth component. On the illusory side, Maercker and Zoellner (2004; Zoellner & Maercker) emphasized the potentially functional purpose of illusory growth in the short term. However, they also stressed the importance of comforting, self-deceptive illusions of growth being accompanied by, or followed by, deliberate rumination. They argue that it is through constructive thought processes that there exists the potential for illusory growth to progress into authentic growth. Otherwise, survivors may succumb to the maladaptive behaviours associated with prolonged avoidance. Maercker and Zoellner identified authentic growth as the second part of the two-component model. In this direction, individuals immediately exhibit positive adaptive coping strategies such as effective emotion-regulation, and continue to move forward with deliberate rumination and constructive problem-solving. This process can then influence modifications to existing schemas and beliefs, which can then lead to

the development of positive psychological changes that did not exist prior to the traumatic event: posttraumatic growth. This sequence is illustrated in Siegel and Schrimshaw's (2000) study that showed how the diagnosis of HIV/AIDS led to the transition from having a life style of drug use to a career in counselling services.

One methodological limitation that contributes to the debate about the authenticity of posttraumatic growth is the lack of prospective studies. While longitudinal studies may be ideal, logistical parameters such as limited time and funding restrict many researchers to the use of retrospective responses. However, one goal of my research was to observe changes over time in university students who had experienced profoundly upsetting life events, and compare such changes to those of students who had not experienced such events.

If posttraumatic growth is just an illusory coping mechanism used to provide temporary relief from the psychological and physical effects of a traumatic event, then, as a group, participants who reported having experienced a profoundly upsetting experience should show an overall decrease on the growth measure at Time 2. If, on the other hand, growth is a real phenomenon that develops over time then an increase should be seen.

Summary of Trauma Outcomes

To summarize, when we examine the various trauma outcomes from a more holistic perspective, we find that trauma affects multiple areas of functioning. However, many individuals recover relatively quickly in enough psychological domains that they can function at their job and in their day-to-day activities. Nonetheless, even while appearing resilient or recovered, these individuals may still be experiencing distress and dysfunction in one or more areas of functioning (Brown et al., 2012; Chambers & Belicki, 1998; Harvey, 1996, 2007; Herman, 1992; Tedeschi & Calhoun, 1995, 2004).

Some people will develop the capacity to recover faster from subsequent traumas as described by Carver's (1998) concept of thriving. Others will have enduring, more global dysfunction (DSM-5). Yet, some individuals may begin with significant dysfunction within a domain or area of psychological functioning and, with time, develop posttraumatic growth (Tedeschi & Calhoun, 1995, 2004). I will next consider the predictors that have been shown to be associated with the various trauma outcomes.

Prediction of Trauma Outcomes

Prediction of resilience and recovery. In the same way that most studies focus on symptoms to *describe* outcomes following trauma, studies of the *predictors* of trauma outcome tend to focus on symptom abatement. These studies have typically found that post-trauma outcomes are predicted by a history of prior trauma as well as specific characteristics of the traumatic event(s): proximity, duration, and severity (American Psychiatric Association, 2013). While this is valuable information that alerts us to the importance of contextual variables for understanding symptom frequency and intensity, it provides too narrow a view of post-trauma responses. I have already noted that a focus on symptom abatement oversimplifies the impact of trauma on functioning. However, Bowman (1999) raises another concern: such studies tend to embrace a mechanistic model that emphasizes the characteristics of traumatic events as predictors of outcome, and thereby disregards the adaptable nature of humankind.

Bowman (1999) called this medical approach the biological dose-response model and argued that medical models may discourage and prevent survivors from developing a sense of self-efficacy because these particular models disregard human agency. More specifically, Bowman contends that medical models place emphasis on rigidly defined and deterministic causal factors, such as the proximity, duration, and severity of the event, to predict post-trauma

clinical disorders such as PTSD. Bowman acknowledges that these factors can predict post-trauma outcomes; however, she argues that this particular medical model is mechanistic in that the principles are rooted in the basic process of stimulus and response. Therefore, the dose-response model grossly underestimates the plasticity and adaptability of living organisms by completely disregarding the powerful and subjective nature of perception and interpretation.

Bowman's (1999) argument about the biological dose-response model is supported by Van Ameringen et al.'s (2008) findings that while three quarters of Canadians will experience at least one traumatic event in their lifetime, only 10% will experience PTSD. Specifically, the occurrence of aversive experiences is disproportionately greater than the development of trauma-related clinical disorders. From the medical dose-response model, one would expect this lifetime prevalence rate of PTSD to have been significantly higher. Furthermore, previous research findings (Cieslak et al., 2009; Ziv & Israeli, 1973) have also shown that the severity, duration, and proximity of a traumatic event were insufficient markers for predicting trauma-related clinical disorders, which supports the notion that human agency can have a strong influence on behaviour (Benight & Bandura, 2004). Specifically, individuals have the ability to act on their world with intentional and goal-oriented behaviour(s), by engaging in such positive coping strategies as emotion-regulation, deliberate rumination, and constructive problem-solving.

For example, Cieslak et al. (2009) recruited 90 Hurricane Katrina survivors from an HIV outpatient clinic, all of whom except two had been evacuated from their homes. Considering the severity, proximity, and duration of the hurricane, the biological dose-response model would predict the diagnosis of clinical disorders in most, if not all of the survivors (as generally argued by Bowman, 1999). However, despite the pervasive damage of the Atlantic storm, the data showed that only one third of the participants were experiencing PTSD (Cieslak et al.). In a

similar study, Ziv and Israeli (1973) recruited 103 Israeli children who had experienced frequent bombings during, and following the six-day war with Egyptian Arabs, and 90 Israeli children who had not experienced any type of warfare. Despite the severity, proximity, and duration of the traumatic event, the results showed no significant difference in anxiety scores between the two groups of participants. These findings provide evidence and support Bowman's argument that trauma-related pathology cannot be predicted simply from the characteristics of the event. Furthermore, it is argued that factors such as human agency (Benight & Bandura, 2004), subjective perception and interpretation of the traumatic event (Cann et al., 2010; Lindstrom, Cann, Calhoun, & Tedeschi, 2013), perceived level of social support (Benight & Bandura, 2004; Bonanno, Galea, Bucciarelli, & Vlahov, 2007; Cieslak et al., 2009; Reissman, Klomp, Kent, & Pfefferbaum, 2004; Schaefer & Moos, 1998) and personality/dispositional attributes (Agaibi & Wilson, 2005; Bowman, 1999; Casella & Motta, 1990; McCrae & Costa, 1986; Segovia et al., 2012) are better predictors of post-trauma outcomes. That said, it must be noted that all of these studies did not measure and control for prior trauma history. Therefore, as the variables they studied may well be affected by trauma history, we have to be cautious in drawing conclusions about how strongly these findings support Bowman's argument. Although predicting resilience was not the focus of this study, participants completed several measures related to Bowman's argument (such as world beliefs, optimism and coping style) as well as a measure of trauma history.

Previous research findings have shown that social support can promote adaptive coping strategies by initiating positive cognitive processes such as emotion-regulation that in turn, initiates functional behaviour (Bonanno et al., 2007; Cieslak et al., 2009; Reissman et al., 2004; Schaefer & Moos, 1998). Positive coping strategies are described as having the ability to

actively approach and either resolve, minimize, or accept stressful life events in a positive and adaptive manner (Aspinwall, Richter, & Hoffman, 2001; Folkman & Lazarus, 1980; Scheier & Carver, 1987; Scheier, Weintraub, & Carver, 1986; Tedeschi & Calhoun, 1995, 1996, 2004; Triplett et al., 2012; Wood, Britt, Wright, Thomas, & Bliese, 2012).

For example, Bonanno et al. (2007) recruited 2700 participants from New York City, six months after the traumatic event of 9/11. The results showed a significantly positive association between the survivors' subjective perception of having high levels of social support and their functional behaviour. Moreover, participants who reported perceptions of having low levels of social support were 30% less likely to exhibit resilient behaviours.

While these findings support the premise that social support can have a significant influence for promoting functional behaviour(s), it has been argued that the quality of social support is what determines its overall effect (Benight & Bandura, 2004; Bonanno et al., 2007; Cieslak et al., 2009; Reissman et al., 2004; Schwarzer & Knoll, 2007). Specifically, instrumental, also known as "constructive" social support refers to support that is practical and instructional, such as teaching and encouraging survivors how to engage in positive coping strategies (Benight & Bandura; Schwarzer & Knoll).

In contrast, it is argued that passive social support, which refers to a supporter listening to a survivor and/or simply having the mere presence of the supporter, may impede the survivor's perception of self-efficacy, and hinder the use of positive adaptive coping strategies. Specifically, this type of support system offers no encouragement and guidance on how to overcome adversity (Benight & Bandura, 2004; Schwarzer & Knoll, 2007).

For example, Schwarzer and Knoll (2007) recruited 173 couples in which one of the partners was undergoing cancer surgery. The patients completed a coping questionnaire six

months post surgery that measured various types of positive coping, and their partners completed a social support scale one month after their partner's surgery to measure their type of partner-provided support. The results showed that instrumental and emotional support together explained 21% of the variance in the variable of positive adaptive coping strategies. (Emotional support alone was not predictive presumably because is it a form of passive support). More specifically, these findings suggest that it was instrumental and passive support that contributed to the positive adjustment and "fighting spirit" exhibited by the cancer patients.

These findings support the premise that it is constructive support that is the most valuable type of social encouragement because it can foster self-efficacy by facilitating and coaching the development of positive adaptive coping strategies (Benight & Bandura, 2004; Bonanno et al., 2007; Casella & Motta, 1990; Cieslak et al., 2009; McCrae & Costa, 1986; Reissman et al., 2004; Schaefer & Moos, 1998; Schwarzer & Knoll, 2007). As defined previously, positive coping strategies are described as having the ability to regulate emotions to a manageable level and to actively attempt to resolve, minimize, or accept the stressful life event (Aspinwall et al., 2001; Folkman & Lazarus, 1980; Scheier & Carver, 1987; Scheier et al., 1986; Tedeschi & Calhoun, 1995, 1996, 2004; Triplett et al., 2012; Wood et al., 2012).

An example of the positive effects that occur through positive adaptive coping strategies can be shown in Wood et al.'s (2012) study that surveyed 2086 soldiers who had been deployed in Iraq. The results showed that even after experiencing multiple deployments, many soldiers had reported finding benefits from their active service. To determine whether prior deployments had an effect on benefit finding, Wood and colleagues conducted a second analysis controlling for multiple deployments. The results were similar to the original findings, in that many soldiers reported positive benefits from their war experience. Participants reported feelings of pride,

courage, and confidence, the development of cohesive interpersonal relationships, gaining the ability to cope better with stress, and overall, that the experience had a positive effect on their life. Wood and colleagues postulated that this type of positive coping helped to protect deployed soldiers from succumbing to risky behaviours such as denial and anxiety, while encouraging functional behaviour. However, while having a positive outlook may help to maintain functional behaviour during adverse experiences, research has shown that positive coping strategies entail more than simply having a 'good' attitude (Folkman & Lazarus, 1980).

Folkman and Lazarus (1980) identified two general coping styles: emotion-focused and problem-focused coping. Emotion-focused coping is an attempt to alleviate or at least minimize the intensity of emotions because they interfere with the ability to approach a stressful situation in a constructive and effortful manner. This strategy is similar to Harvey's (1996) notion of symptom mastery, in which survivors must cope with symptomatic arousal and regulate their emotions so that they are not overwhelmed and made dysfunctional by their presence. Problem-focused coping is defined as actively approaching a stressful situation in attempts to alleviate, or at least reduce, the impact of the outcome by way of constructive problem-solving. The extent to which each coping process is applied following a stressful life experience depends on the context of the situation. That said, Folkman and Lazarus (1980) conducted a study on coping strategies using a scale that measured emotion and problem-focused coping. Participants stated that they used both emotion and problem-focused coping for more than 98% of the 1332 stressful events reported.

In general, Folkman and Lazarus (1980) argue that studies investigating the phenomenon of coping should view it as a process that involves both emotion-focused and problem-focused coping. Furthermore, although problem-focused coping is often touted as superior to emotion-

focused, Folkman and Lazarus argue that both coping strategies are important for promoting functional/ resilient behaviour and preventing post-trauma pathology. For example, emotion-focused coping is appropriate immediately following a stressful life event because it keeps an individual from being overwhelmed by post-trauma symptomatology.

In addition to the positive effects of instrumental social support encouraging appropriate emotion-focused and problem-focused coping, researchers have argued (Bowman, 1999), and shown (Casella & Motta, 1990; McCrae & Costa, 1986; Segovia et al., 2012) that specific dispositions can predict post-trauma outcomes.

Previous studies have shown neuroticism to be associated with negative emotionality, impulsive tendencies, avoidant behaviour, and poor coping skills (McCrae & Costa, 1986). To illustrate the degree to which neurotic behaviours can influence an individual's level of vulnerability to traumatic events, Casella and Motta (1990) conducted a study with 107 Vietnam veterans and found that neuroticism was a significant predictor of PTSD, independent of combat exposure. McCrae and Costa have shown that these associations between neuroticism and vulnerability are a reflection of dysfunctional behaviours such as indecisiveness and hostile reactions, which were also shown to be related to ineffective coping strategies.

Furthermore, research findings have repeatedly shown that maladaptive coping strategies are associated with poorer psychological outcomes such as increased and /or persistent levels of intrusive rumination, hyper-arousal, anxiety, and/or PTSD (Casella & Motta, 1990; Ormel & Wohlfarth, 1991; Wood et al., 2012). For instance, a study by Ormel and Wohlfarth found that neuroticism had a strong and direct effect on psychological distress; specifically, higher levels of neuroticism was associated with higher levels of distress as measured by worrying, depressive mood, and anxiety. These findings strengthen the evidence showing that particular dispositions

such as neuroticism are associated with vulnerability, maladaptive coping skills, and poor post-trauma outcomes.

In contrast to neuroticism, research findings have shown that dispositional optimism can act as a protective agent against adversity through its tendency to promote positive coping strategies following a traumatic experience (Agaibi & Wilson, 2005; Aspinwall et al., 2001; Helgeson, Reynold, & Tomich, 2006; Prati & Pietrantoni, 2009; Segovia et al., 2012; Scheier et al., 1986). Geers, Wellman, and Lassiter (2009) described optimists as individuals who have the ability to use positive cognitive, self-regulatory, and coping strategies.

In support of the premise that optimism is associated with positive adaptive coping strategies, such as the purposeful engagement of constructive cognitive processes (Aspinwall et al., 2001; Helgeson et al., 2006; Prati & Pietrantoni, 2009), Scheier et al. (1986) conducted a study with 291 undergraduate participants who were asked to describe a highly stressful situation they had experienced two months prior to the study. The participants completed the Ways of Coping Checklist (Folkman & Lazarus, 1980) to determine their coping style and the Life Orientation Test (Scheier & Carver, 1985) to measure the participant's level of optimism. The results showed a positive association between optimism and (a) the ability to accept the reality of a situation, (b) problem-focused coping, and (c) positive reappraisals of the stressful situation. In addition, the results also showed a negative relation between optimism and maladaptive coping strategies such as denial and avoidant behaviour, or to put another way, pessimists were more likely to engage in denial and avoidant behaviour. These findings support Geers et al.'s (2009) conception that optimists are individuals who have the ability to use positive cognitive, self-regulatory, and coping strategies, which in turn can promote resilience.

As a further example, Segovia et al. (2012) recruited 224 Vietnam repatriated prisoners of war (RPW) using a longitudinal data set from the Robert E. Mitchell Centre for Prisoner of War Studies in attempts to show that dispositional optimism was associated with resilience. Resilience was measured based on RPW's not receiving a psychiatric diagnosis within the last 37 years of the study. They found that optimism accounted for 17% of the variance and was the strongest predictor of resilience.

As stated above, it is important to note that a considerable number of studies in the literature on trauma outcomes have not controlled for prior trauma history. It may be that the contexual variables of trauma such as proximity, duration, and severity affect coping style. Specifically, it is possible that prior traumatic experiences undermine effective coping, create and/or exacerbate neuroticism, and influence the extent to which survivors exert agency. Therefore, for exploratory purposes, this study measured prior trauma history.

In summary, research findings have shown strong positive associations among optimism, positive coping strategies, and resilience (Aspinwall et al., 2001; Folkman & Lazarus, 1980; Helgeson et al., 2006; Prati & Pietrantoni, 2009; Scheier et al., 1986; Segovia et al., 2012; Wood et al., 2012). As we will see, these variables that have been shown to predict resilience and recovery have also been shown to predict posttraumatic growth.

Prediction of posttraumatic growth. This study examined the prediction of posttraumatic growth from the following variables: challenged assumptive world (world beliefs), subjective severity of trauma, symptomatology (avoidance, hyper-arousal, and intrusive rumination), deliberate rumination (intentional thought/meaning-making), and, most importantly, dispositional optimism and the associated coping strategies.

Research findings have shown that distress is associated with posttraumatic growth leading to the suggestion that it is the critical component needed to initiate the process of posttraumatic growth (Cann et al., 2010; Park, Cohen, & Murch, 1996; Triplett et al., 2012). For example, Park et al. recruited 203 undergraduate students from an introductory psychology course and asked each participant to describe, and rate, his/her perceived level of stress for an adverse event that occurred within one year of the study. Park and colleagues found that a high level of perceived stressfulness associated with the adverse event was a significant predictor of growth. Similarly, Cann et al. recruited 85 undergraduate students from an introductory psychology course through an optional screening test that determined the students' eligibility to participate in certain studies. If students reported that they had experienced a significantly stressful event in the past 30 days, an email was sent to their university address inviting them to participate in the study and complete a series of questionnaires. The results showed that the degree of a challenged assumptive world (defined and discussed in more detail below) and the stressfulness of the experience as measured by anxiety, avoidance, and hyper-arousal, independently predicted posttraumatic growth. What is particularly significant about this study is that the variables used to measure stressfulness have been used in other studies as an index of resilience (specifically a lack of resilience). Therefore, Cann et al.'s findings can be interpreted to indicate that resilience is negatively related to posttraumatic growth. This is consistent with findings from other studies, as discussed further below.

Tedeschi and Calhoun (1995, 2004) argue that negative physiological arousal, as the impetus for change, is the factor that distinguishes between posttraumatic growth and maturation. Although Tedeschi and Calhoun proposed that distress is a precondition to posttraumatic growth, only one study (Tedeschi & Calhoun, 1996), as noted above, has tested whether growth

following stress is distinguishable from normal maturation. Therefore, in this study, I included a comparison group of individuals who reported that they had never experienced a traumatic event. Compared to the Trauma group, it was hypothesized that the Non-Trauma group would show (a) less growth, (b) less symptoms of distress, and (c) a smaller or no correlation between measures of distress and scores of posttraumatic growth both because it was expected that participants in the control group would not have substantial levels of post-traumatic symptoms and because I hypothesized that their growth was driven by other factors—those associated with normal maturation.

Tedeschi and Calhoun (1995, 1996, 2004) postulate that posttraumatic growth begins with a stressful life event sufficiently disrupting existing world beliefs (cf., Janoff-Bulman, 1989; Parkes, 1971). Assumptive world beliefs consist of a set of fundamental schemas about how the world works. These malleable rules or principles guide our behaviour(s), help us to predict outcomes, and provide explanations about our daily encounters with the environment. For instance, Janoff-Bulman posited that such schemas consist of benevolence of the world (e.g., "*The world is a good place*"), benevolence of people (e.g., "*Human nature is basically good*"), justice (e.g., "*Generally, people get what they deserve*"), controllability (e.g., "*People's misfortunes results from mistakes they have made*"), randomness (e.g., "*Bad events are distributed to people at random*"), luck (e.g., "*I am basically a lucky person*"), self-worth (e.g., "*I am very satisfied with the kind of person that I am*"), and self-controllability (e.g., "*I usually behave so as to bring about the greatest good for me*"). A challenge or threat to any schema can then lead in some people to the re-evaluation and abandonment of one set of beliefs for the development of a new set of world beliefs. It is argued by some that through these modification(s) of assumptive world beliefs, there exists the potential for developing

posttraumatic growth (Janoff-Bulman; Joseph & Linley, 2008; Lehman, Wortman, & Williams, 1987; Tedeschi & Calhoun).

For example, as noted previously, Siegel and Schrimshaw's (2000) study found that after receiving a diagnosis of having HIV/AIDS, participants reported drastic changes in their life style. Lifestyles of having no education and using drugs were replaced with positive accomplishments such as obtaining education and developing a career in counselling. Siegel and Schrimshaw provide several possible reasons for this finding. One in particular suggested that the diagnosis of HIV/AIDS resulted in the reworking and modification of existing schemas and beliefs (Janoff-Bulman, 1989; Lehman et al., 1987; Tedeschi & Calhoun, 1995, 2004). Participants had modified the schemas that were facilitating highly dangerous life styles, to a framework that promoted healthier and more productive life styles. However, Siegel and Schrimshaw did not measure the extent to which participants perceived a challenge to their assumptive world. Therefore, it is not clear whether shattered beliefs about how the world works influenced the survivors' subsequent positive life changes.

However, although limited, there are empirical findings that have shown a positive association between the degree of a shattered assumptive world and posttraumatic growth (Cann et al., 2010; Lindstrom et al., 2013). In a study conducted by Cann et al., 43 participants that had been recently diagnosed with leukemia were asked to complete a measure of the degree of challenge to assumptive world beliefs and the Posttraumatic Growth Inventory within one week and again, 6 weeks following admission for treatment. The results showed that disrupted world beliefs at Time 1 significantly predicted posttraumatic growth scores at both Time 1 and Time 2. Furthermore, Cann and colleagues also found that the degree of challenge to assumptive world beliefs was significantly and positively associated with levels of post-trauma symptomatology, in

that higher symptomatology was related to higher degrees of disruption to assumptive world beliefs.

In a similar study, Lindstrom et al. (2013) followed up Cann et al.'s (2010) research by recruiting 129 undergraduate university students that had experienced a highly stressful life event within two years of their study. Participants completed both a measure of the degree of challenge to assumptive world beliefs and posttraumatic growth. The results showed that scores from the world beliefs questionnaire predicted 34% of the variance in posttraumatic growth. Furthermore, Lindstrom et al.'s study found a positive association between subjective perceptions of the stressfulness of the event and measures of challenged world beliefs. Finally, Carboon, Anderson, Pollard, Szer, and Seymour (2005) ran a series of multiple regressions to determine the extent to which each subscale of the World Assumptive Scale (WAS), a measure of beliefs about the world, predicted each domain of posttraumatic growth. Each domain was predicted by at least one subscale of the WAS measure. For instance, the domain of personal strength was shown to be predicted by high beliefs in justice and luck, and low levels of belief in self-worth and self-control. For the purpose of this study, the WAS will be used to measure participants' beliefs about the world. While these studies did not examine any causal relationships, the findings provide further support for the theoretical premise (Tedeschi & Calhoun, 1996, 2004) that posttraumatic growth begins with a stressful life event sufficiently disrupting and challenging existing assumptive world beliefs.

There is limited research that identifies and integrates the various elements that explain how and why distressed participants progress from having shattered world beliefs to the development of posttraumatic growth. This study intends to address these limitations by

identifying the processes and elements that link posttraumatic growth with challenged assumptive world beliefs and posttraumatic distress.

One study of significance was conducted by Triplett et al. (2012). They performed a path-analysis to determine the relations among variables believed to be associated with the process of posttraumatic growth. Three hundred and thirty-three introductory psychology students were given a list of nine traumatic events that included such items as death of a family member, medical illness of self or someone close, and rape. They were asked to select one that they had experienced in the preceding 30 months and to rate the severity of the event. If students had experienced more than one of the proposed events, they were asked to choose the one that caused the most distress. Students who had not experienced a traumatic event were not eligible to participate in the study. Next, students completed several questionnaires that included measures of world beliefs, intrusive and deliberate rumination, avoidance and hyper-arousal, and posttraumatic growth. The path analyses showed that world beliefs had a direct and indirect influence through intrusive and deliberate rumination on posttraumatic growth, and that deliberate rumination had a direct influence on growth, with 39% of the variance in posttraumatic growth accounted for by these two variables. The findings suggest that positive adaptive coping strategies such as deliberate rumination are an important process in the development of growth and that distress may not have an independent impact on posttraumatic growth apart from challenges to world beliefs. However, this finding needs to be replicated because Cann et al. (2010) did find that distress and challenged world beliefs independently predicted posttraumatic growth.

Janoff-Bulman's (1992) concept of motivation provides a theoretical perspective that may explain more generally why individuals engage in positive adaptive coping that can then lead to

the development of posttraumatic growth. She states that all people are motivated to make sense of their stressful life event because it challenges their beliefs about how the world works. After making sense of the stressful life event, some individuals are motivated to alleviate or minimize the incongruent information between the meaning of the stressful life event and their assumptive world beliefs. This need for compatibility encourages the process of integration, whereby the stressful life event is merged with existing schemas and beliefs, and modifications are made to reflect the perceived meaning of the situation.

While Janoff-Bulman's (1992) conception of motivation provides a helpful general framework, it does not explain what might account for the remaining variance in posttraumatic growth above-and-beyond challenged world beliefs and positive coping strategies. However, as described in more detail below, previous research findings (Aspinwall et al., 2001; Folkman & Lazarus, 1980; Helgeson et al., 2006; Prati & Pietrantoni, 2009) have found that particular dispositions such as optimism are associated with a tendency to utilize positive coping strategies that are predictive of adaptive post-trauma outcomes. Therefore, I will argue that optimism moderates the relation between shattered world beliefs and posttraumatic growth, as well as the relation between distress and posttraumatic growth (should distress independently predict posttraumatic growth), and that coping style explains these associations.

Optimism and posttraumatic growth. There is strong evidence that optimism is associated with the increased likelihood of growth following trauma (Helgeson et al., 2006; Prati & Pietrantoni, 2009). Helgeson et al. conducted a meta-analysis of posttraumatic growth with 11 studies containing measures of optimism (N = 2628), and Prati and Pietrantoni conducted a meta-analysis of 27 studies that measured optimism (N = 4794); both meta-analyses found that optimism was positively and significantly associated with posttraumatic growth. A prototypic

example of this research is a study by Davis, Nolen-Hoeksema, and Larson (1998). They measured the association between optimism and growth in 205 participants who were dealing with the loss of a family member. Respondents completed measures of optimism/pessimism and posttraumatic growth both 6 and 13 months post-loss. The results showed that only high levels of optimism was associated with growth, and that over half of these optimistic individuals reported positive psychological changes in the following categories: a new found meaning of life, development of personal strength, and closer, more intimate relationships. While these findings provide evidence that optimism is associated with growth, it does not explain how and why this disposition is related to positive psychological changes following a traumatic experience.

As discussed earlier in this paper, past research has shown that optimists have a tendency to utilize positive adaptive coping strategies such as deliberate rumination or purposeful thought, reflection, positive reappraisal, acceptance, and constructive problem-solving (Aspinwall et al., 2001; Folkman & Lazarus, 1980; Scheier et al., 1986; Tedeschi & Calhoun, 1995, 1996; Triplett et al., 2012; Wood et al., 2012). However, few studies have examined both optimism and its associated coping styles in a mediational model of posttraumatic growth.

One study of significance was conducted by Büyükaşik-Çolak, Gündoğdu-Aktürk, & Bozo (2012), in which they tested a mediation model using coping strategies as the mechanism to explain the relation between dispositional optimism and posttraumatic growth. The results showed that positive adaptive coping strategies fully explained the relation between optimism and posttraumatic growth. However, one limitation to Büyükaşik-Çolak et al.'s study is that they only included three of the elements found to be important for the development of posttraumatic growth. Therefore, to delineate the process of posttraumatic growth further, this study will

extend Büyükaşik-Çolak and colleagues' study by measuring other variables that have been shown to be associated with growth: perceived stressfulness of the traumatic event (Cann et al., 2010; Lindstrom et al., 2013) and degree of shattered world beliefs (Cann et al., 2010; Triplett et al., 2012).

Optimism, resilience, and posttraumatic growth. Previous research has shown that optimism is associated with resilience (e.g., Segovia et al., 2012), while other studies have shown that resilience is negatively associated with posttraumatic growth (e.g., Levine, Laufer, Stein, Hamama-Raz, & Solomon, 2009). How can we reconcile these pair of findings with the fact that optimism is positively correlated with posttraumatic growth (Helgeson et al., 2006; Prati & Pietrantoni, 2009)? Segovia et al.'s findings that optimism was a significant predictor of resilience suggest that optimists use coping strategies that maximize the likelihood of recovering more quickly, hence resilience. However, if an optimist's assumptive world is disrupted beyond a certain threshold, then not even an optimist can recover swiftly. In the face of continued distress optimists begin by managing their emotions until those reach a tolerable level, and then pursue active attempts to constructively problem-solve the stressor (Aspinwall et al., 2001; Folkman & Lazarus, 1980; Scheier et al., 1986). Therefore, those same positive adaptive coping strategies that bring optimists to resilience may carry them to posttraumatic growth when swift recovery is not possible.

Temporal processes of posttraumatic growth. Tedeschi and Calhoun's (2004) cognitive process model postulates that the development of posttraumatic growth is progressive in nature because it requires the gradual process of deliberate rumination. In an attempt to provide empirical evidence for the premise that posttraumatic growth requires time to develop (Janoff-Bulman, 1989; Tedeschi & Calhoun), Ullrich and Lutgendorf (2002) recruited 122

undergraduate students and randomly assigned them to three different groups: emotional (group 1), cognitive and emotional (group 2), and controlled (group 3). All three groups were asked to write in a journal twice a week for one month; however, groups 1 and 2 were asked to write about a highly stressful life event that evoked distress, and the control group was asked to write about their thoughts pertaining to traumatic events seen or heard by the media. The emotional group was asked to write only about their emotions pertaining to their reported traumatic event, while the cognitive/emotional group was asked to write about their emotions and thought processes in reference to their traumatic experience. All three groups completed the PTGI both before and after their 30-day journal entries. The results showed a significant interaction between group and time. Specifically, only group 2 (cognitive/emotional) showed a significant increase in positive cognitive processes, such as purposefully ruminating and attempting to make sense of their traumatic experience. Furthermore, Ullrich and Lutgendorf found that only group 2 showed a significant increase in posttraumatic growth scores from Time 1 to Time 2, and that increases in cognitive processing were associated with higher growth scores.

Similarly, Moore et al. (2011) repeatedly measured the degree of positive psychological changes that occurred (one, three, and six months post-diagnosis) within individuals that had been diagnosed with cancer. The results showed that scores on the growth scale significantly increased across the six-month period in the domain of closer relationships. These findings support Tedeschi and Calhoun's (2004) theoretical model that emphasizes the gradual unfolding of cognitive processes such as deliberate rumination, by providing evidence that time is an important factor for the development of posttraumatic growth.

We have seen that positive psychological changes develop over time, at least in part, as a result of positive adaptive coping strategies such as deliberate rumination (Folkman & Lazarus,

1980; Triplett et al., 2012; Ullrich & Lutgendorf, 2002). Taken with Tedeschi and Calhoun's (2004) contention that growth develops gradually, and the limited number of prospective studies of posttraumatic growth, this study addressed the development of posttraumatic growth over time by conducting a longitudinal study. Participants were asked to complete the posttraumatic growth questionnaire twice, separated by a 2-month interval. Obtaining measures at different time points permitted the testing of the hypothesis that cognitive processes such as deliberate rumination at Time 1, will predict posttraumatic growth at Time 2. It was expected that at least some participants would show posttraumatic growth at Time 1 because the stressful life event that brought them into the study may have occurred up to two years prior to the study.

Sex differences in posttraumatic growth. Previous research findings have shown that women are more likely to report posttraumatic growth than men (Helgeson et al., 2006; Park et al., 1996; Prati & Pietrantoni, 2009; Tedeschi & Calhoun, 1996). For instance, Kesımcı, Göral, and Gençöz (2005) measured various types of coping and stress-related growth in 132 university undergraduate students and found that women reported significantly more growth compared to men. However, not all studies have found such a relation. Polatinsky and Esprey (2000) recruited bereaved men and women who had previously lost a child, and found no significant gender difference in reported growth. So what could account for these contradictions? Folkman and Lazarus (1980) have shown that men and women engage in different types of coping depending on the context of the stressful life event. While this is an important issue, it was beyond the scope of this study to examine the context in which men and women use specific coping strategies. Therefore, sex differences were considered only in exploratory analyses.

Summary

In summary, research studies have shown associations between posttraumatic growth and (a) assumptive world beliefs (Cann et al., 2010, 2011; Lindstrom et al., 2013; Triplett et al., 2012), (b) subjective perceptions of trauma severity (Lindstrom et el.; Park et al., 1996), (c) symptoms of distress (Cann et al.; Park et al.), (d) optimism (Büyükaşik-Çolak et al., 2012; Davis et al., 1998; Helgeson et al., 2006; Prati & Pietrantoni, 2009), (e) positive coping strategies (Folkman & Lazarus, 1980; Helgeson et al., 2006; Prati & Pietrantoni, 2009; Triplett et al., 2012), (f) time (Moore et al., 2011; Ullrich & Lutgendorf, 2002), and (g) sex (Folkman & Lazarus, 1980; Helgeson et al.; Kesımcı et al., 2005; Park et al.; Prati & Pietrantoni). However, to my knowledge, there are no research studies that have integrated these particular elements into a cohesive model that describes the process of posttraumatic growth. Therefore, this research was designed to extend the literature on posttraumatic growth by integrating how and why particular variables and processes are associated with, and predictive of, posttraumatic growth. Specifically, it was hypothesized that when a highly stressful life event occurs, this event elicits distress in the person experiencing the stressor and for some, challenges their assumptive world. Both distress and challenged world assumptions in turn result initially in people experiencing intrusive rumination, avoidance, and hyper-arousal. However, optimists are more likely to employ adaptive coping strategies such as engaging in the gradual process of deliberate rumination. In the first instance these strategies can result in a fairly rapid reduction in posttraumatic symptoms. However, if the impact of the trauma is so extensive that swift recovery is not possible, these same adaptive coping strategies, over time, can lead to the development of posttraumatic growth.

It should be noted that from the literature it is unclear whether distress and shattered assumptions independently predict posttraumatic growth, because the findings of Cann et al. (2010), who did find independent predictions, contradict those of Triplett et al. (2012) who found that only challenged world assumptions predicted posttraumatic growth. A complicating factor is that distress and challenged world assumptions are correlated (Lindstrom et al., 2013). Therefore, I measured both distress and assumptive world beliefs.

In summary, this study tested a mediated moderation model in which dispositional optimism affects the impact that both shattered assumptive world beliefs and distress have on the development of growth by way of positive coping styles such as deliberate rumination. As noted above, it may be that only challenged world beliefs are relevant in the model, because of Ullrich and Lutgendorf's (2002) findings that showed that it is cognitive processing that facilitates posttraumatic growth, not just emotional processing. It is reasonable to think that challenged beliefs would be more likely to trigger deliberate rumination than distress alone. However, this is speculative, and in the absence of clearer direction from the research literature, I hypothesized that as scores on optimism increased, there would be a stronger relation between posttraumatic growth and both distress and challenged assumptions due to the operations of adaptive coping such as deliberate rumination. In addition to extending our understanding of how posttraumatic growth occurs, if the mediated-moderation model is supported, it will argue against posttraumatic growth being just avoidance coping.

In addition, this study was designed to test whether posttraumatic growth can be distinguished from maturation and normal development by including a comparison group that had not experienced a traumatic event. I also explored the relation of sex and prior trauma history to the variables being studied.

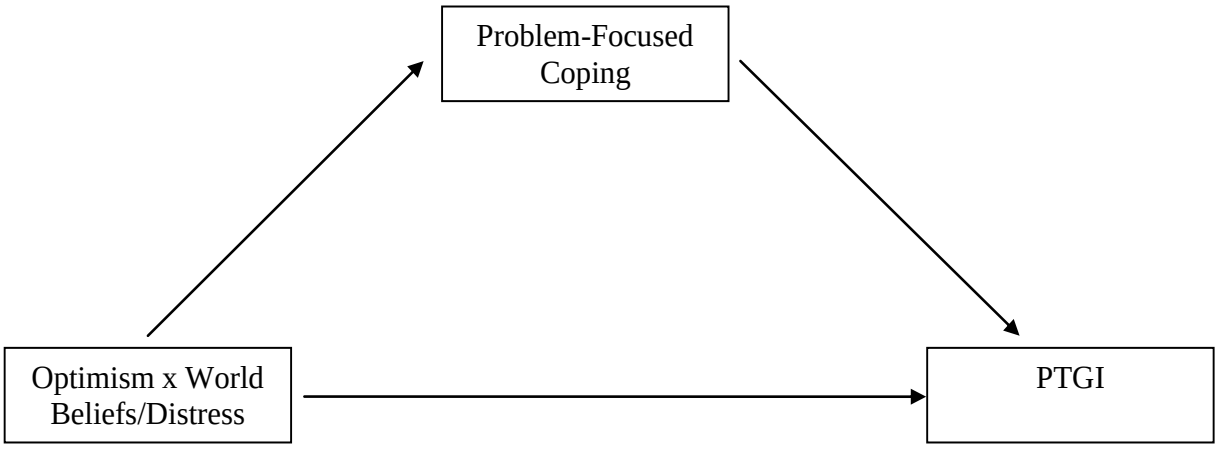

Figure 1. Mediated-Moderation Model. The figure illustrates the process for developing posttraumatic growth.

Hypotheses

It is hypothesized that:

1. Participants in the Trauma group will differ from the Non-Trauma group in a number of ways. There are insufficient, prior research findings to predict precisely how they will differ, but I tested the following hypotheses:
    a. At Time 1 and Time 2, at least some participants in the Trauma group will have higher self-ratings of growth than the Non-Trauma group. Therefore, the Trauma group will either have higher mean scores on self-rated growth, as Tedeschi and Calhoun (1996) found, and/or will have greater variability in scores.
    b. Compared to the Non-Trauma group, the Trauma group will show a greater increase in growth from Time 1 to Time 2.
    c. The Trauma group will have higher scores on measures of symptomatology (intrusive rumination, hyper-arousal, and avoidance). Differences between the two groups on optimism, deliberate rumination, and problem-focused coping will be explored.

d. Growth will be correlated with symptomatology in the Trauma group, but not the Non-Trauma group. It is unclear whether the two groups will differ in the relation of challenged world beliefs to growth. Because the first year of university can be associated with upheavals in beliefs, it is possible the non-traumatized group will experience sufficient challenge to their assumptions that may promote growth. This will be explored.

The remaining hypotheses apply most clearly to the Trauma group, but their application on the Non-Trauma group will be explored, as relevant.

2. Posttraumatic growth will be positively related to symptomatology, disrupted world beliefs, optimism, problem-focused coping, and deliberate rumination.
3. Optimism will be related to problem-focused coping, and deliberate rumination.
4. Distress and challenged world beliefs will independently predict posttraumatic growth.
5. The association between a challenged assumptive world and posttraumatic growth will be moderated by optimism. More specifically, as scores of optimism increase there will be a stronger positive association between challenged assumptive world beliefs and posttraumatic growth. There is no basis to hypothesize the nature of the relation when scores are in the pessimism range, specifically, whether there will be no relation or a negative relation between challenged world beliefs and posttraumatic growth.
6. The above interaction will be mediated by problem-focused coping.
7. The association between post-trauma distress (subjective severity of the stressful event and symptomatology) and posttraumatic growth will be moderated by optimism. More specifically, as scores of optimism increase there will be a stronger positive association between distress and posttraumatic growth. There are no grounds to hypothesize the

nature of the relation when scores are in the pessimism range, specifically, whether there will be no relation or a negative relation between distress and posttraumatic growth.

8. The above interaction will be mediated by problem-focused coping.

The following two hypotheses were exploratory.

1. As a group, women in the Trauma group will show a higher frequency of using problem-focused coping, and have higher scores on the PTGI as compared to men. Sex differences in the other variables being studied will be explored.
2. Within the Trauma group, optimism, deliberate rumination, and problem-focused coping will be related to posttraumatic symptoms.

Methods

Participants

Participants were 157 first year undergraduate Psychology students, 145 women and 12 men, between 17 and 25 years of age. They were recruited through an online research pool (SONA) for a study entitled "Life Changes During Early Adulthood". The study description stated that (a) we were looking for people who have had a profoundly upsetting or traumatic experience in the prior two to twenty-four months, and people who have never had such experiences, (b) participation would be online, (c) it was a two part study with a 2-month interval between sessions, with both sessions requiring approximately 60 minutes to complete, (d) participants' information would be private and confidential, and (e) as compensation for participation, participants would be given one hour of course credit for each session of participation. The SONA ad advised participants that an electronic link would be sent to their student email address within 72 hours of their sign-up, and that they would have 3 days to complete the questionnaires.

At Time 1, a total of 70 participants, 4 men and 66 women, reported having had a profoundly upsetting or traumatic experience (Trauma group) within two to twenty-four months of the study, and 87 participants, 8 men and 79 women, reported never having had a deeply upsetting or traumatic experience (Non-Trauma group). Sixty days after completing the questionnaires for Time 1, a second link for part 2 of the study was sent to the participants' student email address. Participants were advised that they would have 3 days to complete the questionnaires.

Of the 157 original participants a total of 115 (73.2%) completed the Time 2 measures: 57 from the Trauma group (3 men and 54 women), and 58 from the Non-Trauma group (6 men

and 52 women). Although the Trauma group appears to have a higher completion rate than the Non-Trauma group (81.4% versus 66.7%) the corresponding Chi-Square with Yates' correction was not significant ($\chi^2 = .48$).

Materials

See appendices for copies of the questionnaires.

Demographic information. At Time 1, participants were asked their age, sex, racial/ethnic background, and email address. They were also asked to indicate which of the following best described their experience:

- I have had a profoundly upsetting experience at some point in my life
- I have *never* had a profoundly upsetting experience in my life
- I do not know or I am unsure

If participants chose the "I do not know or I am unsure" option, they received a message indicating that they were not eligible to participate in the study, thanking them for their interest, and informing them that they would be given 15 minutes of course credit. Participants were also given a debriefing letter that included a list of counselling services and a copy of the consent form that could be printed or saved. A total of 28 participants chose this option, and of these, 12 subsequently contacted the researcher stating they had chosen this option in error and asked to be re-admitted to the study. These students were allowed to participate; however, a record was made of their error in case their data later proved to be anomalous.

If participants indicated that they had a profoundly upsetting experience, they were then asked "When did the most recent profoundly upsetting experience occur?" and were provided with the following options:

- Less than 2 months ago

- At least 2 months ago, but no more than 2 years ago
- More than 2 years ago

If participants chose either the “More than 2 years ago” (*n* = 27) or "Less than 2 months ago" option (*n* = 10), they received a message indicating that they were not eligible to participate in the study and that their data would not be used in the analyses. However, in response to a concern raised by the Research Ethics Board, the message also indicated that if the participant wanted to complete the questionnaires for their own experience, they would receive one hour of course credit; however, they were not invited back for the second session. Thirty-four participants chose to complete the questionnaires in return for course credit; however, their data was subsequently discarded. If the participants chose not to continue with the study, they received a message indicating that they would receive 15 minutes of course credit. They were also given a debriefing letter that included a list of counselling services and a copy of the consent form that could be printed or saved.

Participants who chose the “having had a profoundly upsetting experience” or “never having had a profoundly upsetting experience” were provided questionnaires relevant to their group membership.

Significant experience and associated perceived stress. At Time 1, both groups of participants were asked to describe an experience that occurred between 2 and 24 months of the study. Participants in the Trauma group were asked to describe a “profoundly upsetting or traumatic life experience," while the Non-Trauma group was asked to describe "their most significant experience." Following the first open-ended question, participants were asked to rate the impact of the event at the time that it had occurred on two 7-point rating scales ranging between 1 (*no impact*) to 7 (*worst imaginable*) and 1 (*no impact*) to 7 (*best imaginable*).

Assumptive World Beliefs. To assess the perceived level of challenge to assumptive world beliefs, at both Time 1 and Time 2 participants were asked to complete the World Assumptive Scale (WAS) (Janoff-Bulman, 1989), a questionnaire with 32-items that are rated on 6-point scales ranging from 1 (*disagree completely*) to 6 (*agree completely*). It has eight subscales: benevolence of the world (e.g., "*The world is a good place*"), benevolence of people (e.g., "*Human nature is basically good*"), justice (e.g., "G*enerally, people get what they deserve in this world*"), controllability (e.g., "*Peoples' misfortunes result from mistakes they have made*"), randomness (e.g., "*Bad events are distributed to people at random*"), self-worth (e.g., "*I am very satisfied with the kind of person I am*"), self-controllability (e.g., "*I usually behave so as to bring about the greatest good for me*"), and luck (e.g., "*I am basically a lucky person*"). Janoff-Bulman reported internal consistency for the eight subscales ranging between .67 to .78. In this sample, it ranged from .64 to .87. Test retest coefficients ranged from .54 to .90 (See Tables 1-3 for Cronbach's alphas and test retest reliability coefficients for all measures).

Optimism. At Time 1, participants were asked to complete The Life Orientation Test Revised (LOT-R; Scheier, Carver, & Bridges, 1994), which is designed to measure optimism, with high scores indicating optimism and low scores pessimism. The questionnaire has 10-items (e.g., "*I hardly ever expect things to go my way*") that are rated on 5-point scales ranging from 1 (*I agree a lot*) to 5 (*I disagree a lot*). Scheier et al., reported a Cronbach's alpha of .78, and a test-retest reliability coefficient of .79 (over a 28-month interval), which was comparable to what was observed in this sample (alpha = .77).

Coping Styles. To assess various coping styles, at both Time 1 and Time 2 participants were asked to complete The Coping Scale **(**COPE) (Carver, Scheier, & Weintraub, 1989), which is a 60-item questionnaire using 4-point rating scales ranging from 0 (*I usually don't do this at*

all) to 4 (*I usually do this a lot*) that has 15 subscales of coping. Positive Reinterpretation (e.g., "*I learned something from the experience*"), Use of Instrumental Support (e.g., "*I sought advice from someone about the situation*"), Active Coping (e.g., "*I concentrate my efforts on doing something about it*"), Acceptance (e.g., "*I accept that this happened and that it can't be changed*"), Planning (e.g., "*I try to come up with a strategy about what to do*"), Mental Disengagement (e.g., "*I turn to work or other substitute activities to take my mind off things*"), Denial (e.g., "*I act as though it never even happened*"), Substance Use (e.g., "*I use alcohol or drugs to make myself feel better*"), Behavioural Disengagement (e.g., "*I admit to myself that I can't deal with it, so I quit trying*"), Focus On and Venting of Emotions (e.g., "*I feel a lot of emotional distress and I find myself expressing those feelings a lot*"), Religious Coping (e.g., "*I pray more than usual*"), Humour (e.g., "*I make fun of the situation*"), Restraint (e.g., "*I make sure not to make matters worse by acting too soon*"), Use of Emotional Support (e.g., "*I talk to someone about how I feel*"), and Suppression of Competing Activities (e.g., "*I put aside other activities in order to concentrate on this*"). Carver et al. reported that Cronbach's alpha for the 15 subscales ranged from .45 to .92.

For the purpose of this study, two composite coping styles that had been previously used by Dennard and Richard (2013), were included which each style was comprised of three subscales of coping. The first coping style was Problem-focused Coping and consisted of the Active, Planning, and Suppression of Competing Activities coping subscales, with a Cronbach's alpha of .83 (Dennard & Richard, 2013). In this sample, Cronbach's alpha was .89, with a test retest coefficient of .81. The second category was Avoidant Coping, and consisted of the Mental Disengagement, Behavioural Disengagement, and Denial coping subscales, with a Cronbach's

alpha of .75 (Dennard & Richard). The reliability in this study had a Cronbach's alpha of .81, with a test retest coefficient of .80.

Deliberate Rumination Scale (DRS). At Time 1 and Time 2, participants were asked to complete the DRS (Cann et al., 2011), which is a 10-item questionnaire using 4-point rating scales ranging from 0 (*never experienced*) to 3 (*often experienced*) that measures intentional thoughts about a stressor (e.g., "*I thought about the event and tried to understand what happened*"). Cann et al. reported a Cronbach's alpha of .88, which was comparable to what was observed in this sample (alpha = .86, with a test retest reliability of .68). Cann et al. also noted that the DRS correlated with measures of reflective thinking, demonstrating good construct validity.

Posttraumatic symptoms. To assess posttraumatic symptoms, at both Time 1 and Time 2 participants were asked to complete the Impact of Events Scale Revised (IES-R) (Wiess & Marmar, 1997), which consists of 22-items rated on 5-point rating scales ranging from 0 (*not at all*) to 4 (*extremely*). It has three subscales: Avoidance (e.g., "*I tried to remove it from my memory*"), Intrusion (e.g., "*I thought about it when I didn't mean to*"), and Hyper-arousal (e.g., "*Reminders of it caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart*"). Weiss and Marmar reported that internal consistency ranged between .82 and .89 and that the IES-R correlated strongly with other measures of post-trauma symptomatology. In this sample, Cronbach's alpha ranged between .72 and .90, with a test retest coefficient of .71 for the Non-Trauma group, and an alpha from .82 and .93 for the Trauma group, with a test retest coefficient of .88.

Posttraumatic Growth. Posttraumatic growth was assessed in two ways. First, at Time 1, participants in both groups were asked to respond to two open-ended questions. The Trauma

group was asked, "*Think about the stressful experience you have just described. How does it affect you now? Please be as **specific** as possible, and where possible give concrete examples.*" and, on a separate page following the first, "*Again, think about the stressful experience you have just described. Did the experience have any positive effects upon you that you have not already described? If yes, please describe and be as **specific** as possible, and where possible, give concrete examples*." The Non-Trauma group was asked, "*Think about the significant experience you have just described. How has it affected you **now**? Please be as **specific** as possible, and where possible give concrete example," followed by "Again, think about the significant experience you have just described. Did the experience have any positive effects upon you that you have not already described? If yes, please describe and be as **specific** as possible, and where possible, give concrete examples.*" It was beyond the scope of this study to conduct a content analysis.

After completing the open-ended questions, at both Time 1 and Time 2 participants completed the Posttraumatic Growth Inventory (PTGI) (Tedeschi & Calhoun, 1996), which consists of 21-items that assess growth in five domains: Appreciation of Life (e.g., "*I changed my priorities about what is important in life*"), New Possibilities (e.g., "*I established a new path for myself*"), Personal Strength (e.g., "*I have a greater feeling of self-reliance*"), Relating to Others (e.g., "*I have a greater sense of closeness with others*"), and Spiritual Change (e.g., "*I have a better understanding of spiritual matters*"). All items are rated on 6-point rating scales ranging from 1 (*I did not experience this change*) to 5 (*I did experience this change to a very great* degree"). Cronbach's alpha for the total scale was .90 and the subscales ranged from .67 to .85, with test-retest coefficients ranging between .37 and .74 (over a two-month interval). In this study, the reliability for the subscales had a Cronbach's alpha from .70 and .91 on the subscales

for the Trauma group, and had an alpha of .93 for the total score. The test retest reliabilities ranged between .71 and 1.00 (over a two-month interval). Cronbach's alphas for the Non-Trauma group ranged from .72 and .90, with an alpha of .94 for the total score. The test retest reliabilities ranged from .70 and .83. Tedeschi and Calhoun found that the PTGI correlated positively with optimism and negatively with neuroticism, suggesting the PTGI has good convergent and divergent validity. The instructions on the questionnaire were modified to reflect present tense "*In terms of the experience you have just described, how does it affect you now*." Given the strong internal consistency of the total score, and the absence of specific hypotheses for types of growth, only the total score was used in analyses.

Trauma History. To assess trauma history, at Time 1 participants were asked to complete the Stressful Life Experiences - short form (SLE-SF) (Goodman, Corcoran, Turner, Yuan, & Green, 1998), a 19-item questionnaire listing various traumatic events (e.g., "*I have witnessed or experienced a serious accident or injury*"). Participants are asked to indicate how many times they have experienced each traumatic life event, with the option of adding an additional event that was not found on the list. Convergent validity was assessed by comparing the number of events reported on the questionnaire with the number of events reported in an interview that occurred within one week of the questionnaire, and the two correlated .77 (Goodman et al.). Test-retest reliability was .89 over a 2-week period. Trauma history was scored by summing up the number of various traumatic experiences. Internal consistency was not calculated as it is not relevant to this measure.

Post study questionnaire. To assess demand characteristics, and to provide participants with an opportunity to give feedback about the study, at both Time 1 and Time 2 participants were given a questionnaire entitled "Participant Feedback" and asked two open ended questions:

1. *"We are always looking to improve our research and questionnaires. Therefore, we would appreciate you giving us any feedback that you may have about any aspect of the study."* and 2. *"We would also be interested in knowing what you think we may find in this study."*

Procedure

All participants completed the questionnaires using Qualtrics, a web-based research tool. Once students signed up for participation and accessed the study through a link sent to their student email address, an online statement of informed consent appeared describing the general purpose of the study and their rights as participants, and asking them to check the "Accept" button in order to provide an electronic signature. A copy of the consent form is in Appendix A. Following consent, participants received a message indicating that they would not be able to return to the previous questionnaire once they hit the forward button, and that they should make sure that they were ready to proceed to the next questionnaire before hitting the forward button. Following this message, participants completed the demographic questionnaire, which included the question that asks them to indicate which group they had belonged to--"I have had a profoundly upsetting experience" (Trauma group), "I have *never* had a profoundly upsetting experience" (Non-Trauma group) or "I do not know or I am unsure". As noted previously, if participants chose the last option, they received a message indicating that they were not eligible to participate in the study, thanking them for their interest, and informing them that they would be given 15 minutes of course credit. They were provided with a debriefing letter that included a list of counselling services and a copy of the consent form that could be printed or saved. Participants in the Trauma and Non-Trauma groups were given the questionnaires relevant to their group membership. In general, the questionnaires were the same but for the IES-R, DRS, and PTGI, the participants in the Trauma group were instructed to complete these with the

traumatic event in mind while the Non-Trauma group was instructed to complete these with the significant event in mind.

Questionnaires were divided into four blocks. The first block had the measures of optimism (LOT-R) and world beliefs (WAS) presented in a counterbalanced order. The second block began with the questionnaire in which participants were asked to describe their significant or profoundly upsetting/traumatic experience (depending on group) and to rate its impact. They were then given the following instruction, "*Thinking about the experience you have just described, please answer the following questionnaires.*" Subsequently the measures of posttraumatic growth (open-ended questions followed by PTGI), deliberate rumination (DRS), symptomatology (IES-R), and coping styles (COPE) were presented in random order. The third block was the Trauma History questionnaire. The fourth block was the Participant Feedback Questionnaire.

Immediately following the completion of the questionnaires, participants received a message (a) that 2 months from the day, they would receive another email with a similar link to complete the second phase of the study, (b) that the second half of the study would require approximately 60 minutes and that they would have 3 days to complete the questionnaires following receipt of the link. They were also given a preliminary debriefing letter that included a list of counselling services and a copy of the consent form that could be printed or saved.

As a courtesy, participants that had signed up for phase 1 of the study but had yet to complete the survey within the three day allotted timeframe, were sent an email reminding them about their sign-up and were provided an additional 72 hours to complete the survey.

Two months following the students' initial participation, a second link was sent to their student email address. Once students opened the link to the study, a second informed consent

statement was provided asking them to check the "Accept" button to provide an electronic signature. A copy of this can be found in Appendix B. Following the consent form, participants received a message indicating that they would not be able to return to the previous questionnaire once they hit the forward button, and that they should make sure that they were ready to proceed to the next questionnaire before hitting the forward button. Following this message, participants completed questionnaires that were divided into four blocks. The first block had the measure of WAS. The second block began with the questionnaire in which participants were asked to describe their most significant experience within the last two months and to rate its impact. In the third block, participants were asked to briefly write about the experience that they had described two months prior during Time 1 of the study. This method was used to increase the salience of their previously reported experience. Participants were then given the following instruction, "*Now thinking about the experience that you DESCRIBED 2 MONTHS AGO DURING SESSION 1 OF THIS STUDY, please answer the following questionnaires*". Following this message, the PTGI, DRS, IES-R, and COPE questionnaires were presented in random order. The fourth block was the Participant Feedback Questionnaire.

Participants were then provided with a copy of the second consent form and a debriefing letter that could be printed or saved.

Results

Preliminary Analyses

Univariate outliers. All responses were screened for multivariate outliers in the entire sample and by group separately for Time 1 and Time 2. Z-scores with absolute values greater than 3.0 were considered potential outliers. At Time 1 in the total sample, there were two participants with a marginally outlying score, one on the avoidant coping scale, and the other on the trauma history measure. When examined within each group, there was only one score greater than 3.0, and it was on the SLEF-SF scale. At Time 2 in the total sample, there were two marginally outlying scores, one on the problem-focused coping scale, and the other on the WAS. Within groups, there was one score greater than 3.0, and it was on the IES measure. For all participants, all of their responses including their open-ended description of a personal experience were reviewed to determine the legitimacy of the score. It appeared that their responses were thoughtful, reasonable, and only marginally significant. Therefore, their data were retained.

Univariate normality. As evident in Tables 1-3, all but two raw skewness scores were less than 1. When converted to Z-scores, all were either non-significant or only marginally significant with the exception of the distribution for the positive rating of experience variable for the Trauma group. The score was highly skewed as most ratings were very low. Considering the Trauma group was asked to rate an experience that they had found profoundly upsetting or traumatic, it was expected that the distribution for positive ratings of experience would be positively skewed. Moreover, these ratings were not included in any major analyses.

Multivariate outliers. To determine if there were any multivariate outliers, distance, leverage, and influence were examined. Responses would be considered problematic if the

values were high in leverage and influence. Cook's D was used to determine the influence, and all values were significantly smaller than 1.00, suggesting that the values had minimal influence on the regression line. Leverage values and studentized residuals did not show any significant indication of multivariate outliers.

Multivariate normality and other assumptions of multiple regression. Scatter plots, PP Plots, and histograms were examined to determine the normality of the distributions and residuals. Overall, only a couple of distributions were slightly positively skewed; however, this was expected considering the nature of the measure: deliberate rumination and optimism. The posttraumatic growth scale was found to be slightly negatively skewed, again, this was expected considering the nature of the measure. Residual plots showed no indication of significant heteroscedasticity, and linearity between the variables was acceptable. Finally, Durbin Watson tests suggested that the residuals were independent, and tolerance values were all well above .40, suggesting that there was no concern for significant overlap amongst the variables.

Descriptive statistics and exploratory analyses. Descriptive statistics, Cronbach's alpha and test-retest reliabilities are provided in Table 1 (total sample), Table 2 (Trauma group), and Table 3 (Non-Trauma group). All measures were shown to have good to excellent reliabilities. The intercorrelations amongst Time 1 variables in the total sample are provided in Table 4 and by group in Table 5. The intercorrelations amongst Time 2 variables in the total sample are provided in Table 6 and by group in Table 7. The intercorrelations amongst Time 1 and Time 2 variables are in Table 8 for the total sample and Table 9 for each group. The intercorrelations amongst the PTGI subscales and the correlations of those subscales and Time 1 and Time 2 variables for the total sample are in Appendix A. All correlations significant to this study will be discussed accordingly.

Table 1

Psychometric Properties of the Study Variables in the Total Sample

Variable	Potential	Actual	*N*	*M (SD)*	A	Test Retest	Skewness[1]
PTG Time 1	1-6	1.00-5.90	157	3.54 (1.12)	.94		-.25
PTG Relate	1-6	1.00-6.00	157	3.49 (1.41)	.91		-.24
PTG Possibility	1-6	1.00-6.00	157	3.42 (1.30)	.81		-.14
PTG Personal	1-6	1.00-6.00	157	3.84 (1.25)	.80		-.52
PTG Appreciate	1-6	1.00-6.00	157	3.77 (1.27)	.82		-.30
PTG Spirit	1-6	1.00-6.00	157	3.31 (1.46)	.78		-.08
PTG Time 2	1-6	1.00-5.76	115	3.60 (.99)	.91	.70	-.11
PTG Relate	1-6	1.00-6.00	115	3.64 (1.31)	.89	.69	-.09
PTG Possibility	1-6	1.00-6.00	115	3.47 (1.19)	.76	.60	-.15
PTG Personal	1-6	1.00-6.00	115	3.85 (1.19)	.75	.57	-.33
PTG Appreciate	1-6	1.00-6.00	115	4.09 (1.34)	.78	.49	-.61
PTG Spirit	1-6	1.00-6.00	115	2.56 (1.56)	.77	.53	.77
Optimism Time 1	1-5	1.33-4.17	157	3.05 (.67)	.78	-	-.53
World Beliefs Time 1	1-6	2.13-4.90	157	3.71 (.57)	.85		-.22
World Beliefs Time 2	1-6	2.06-5.06	115	3.76 (.55)	.85	.82	-.08
Negative Rating	1-7	1.00-7.00	140	4.64 (1.83)	-	-	-.53
Positive Rating	1-7	1.00-7.00	139	3.32 (2.22)	-	-	.29
Symptomatology Time 1	1-5	1.00-1.45	157	2.30 (.90)	.94		.41

Table 1 Continued

Psychometric Properties of the Study Variables in the Total Sample

Variable	Potential	Actual	*N*	*M (SD)*	A	Test Retest	Skewness[1]
Symptomatology Time 2	1-5	1.00-5.00	115	2.20 (.83)	.94	.78	.77
Problem-focused Time 1	1-4	1.00-3.83	157	2.16 (.63)	.89		.30
Problem-focused Time 2	1-4	1.00-3.92	115	2.08 (.61)	.87	.68	.36
Avoidant Coping Time 1	1-4	1.00-3.67	157	1.93 (.56)	.82		.68
Avoidant Coping Time 2	1-4	1.00-3.58	115	1.90 (.56)	.82	.67	.75
Delib. Rum. Time 1	1-4	1.00-4.00	156	2.88 (.66)	.84		-.36
Delib. Rum. Time 2	1-4	1.00-4.00	115	2.83 (.66)	.86	.52	-.79

NOTE. Mean scores were used to prorate any missing data. WAS scores are based on the removal of the first item. T1 = measures for Time 1; T2 = measures for Time 2. PTG Time1/Time2 = overall posttraumatic growth; PTG Relate = growth subscale for relating to others; PTG Possibility = growth subscale for new possibilities; PTG Personal = growth subscale for personal strength; PTG Appreciate = growth subscale for appreciation of life; PTG Spirit = growth subscale for spirituality. Negative Rating = subjective rating of how bad experience was perceived; Positive Rating = subjective rating of how good experience was perceived; Symptomatology = distress measure; Problem-focused = problem-focused coping; Del. Rum. = deliberate rumination.

[1] Standard error of skewness at Time 1 = .19 and standard error of skewness at Time 2 = .23.

Table 2

Psychometric Properties of the Study Variables for the Trauma group

Variable	Potential	Actual	*N*	*M (SD)*	α	Test Retest	Skewness[1]
PTG Time 1	1-6	1.10-5.57	70	3.67 (1.08)	.93		-.32
PTG Relate	1-6	1.00-6.00	70	3.64 (1.45)	.91		-.31
PTG Possibility	1-6	1.00-6.00	70	3.32 (1.29)	.83		-.14
PTG Personal	1-6	1.00-5.75	70	3.99 (1.18)	.77		-.69
PTG Appreciate	1-6	1.00-6.00	70	4.34 (1.19)	.77		-.59
PTG Spirit	1-6	1.00-6.00	70	2.99 (1.63)	.70		.40
PTG Time 2	1-6	1.00-5.76	57	3.70 (.98)	.91	.74	-.11
PTG Relate	1-6	1.00-6.00	57	3.81 (1.30)	.88	.69	-.12
PTG Possibility	1-6	1.00-5.40	57	3.37 (1.09)	.73	.55	-.35
PTG Personal	1-6	1.00-6.00	57	3.87 (1.23)	.80	.61	-.37
PTG Appreciate	1-6	1.00-6.00	57	4.34 (1.19)	.70	.67	-.59
PTG Spirit	1-6	1.00-6.00	57	2.90 (1.59)	.74	.72	.50
Optimism Time 1	1-5	1.33-4.17	70	2.91 (.70)	.80	-	-.36
World Beliefs Time 1	1-6	2.13-4.87	70	3.57 (.61)	.86		-.20
World Beliefs Time 2	1-6	2.06-4.94	57	3.60 (.55)	.85	.78	-.01
Negative Rating	1-7	4.00-7.00	70	5.94 (.93)	-	-	-.44
Positive Rating	1-7	1.00-6.00	57	1.95 (1.41)	-	-	1.61
Symptomatology Time 1	1-5	1.45-4.45	70	2.97 (.77)	.91		.04
Symptomatology Time 2	1-5	1.33-5.00	57	2.60 (.83)	.93	.79	.61

Table 2 Continued

Psychometric Properties of the Study Variables for the Trauma group

Variable	Potential	Actual	*N*	*M (SD)*	α	Test Retest	Skewness[1]
Problem-focused Time 1	1-4	1.00-3.83	70	2.07 (.59)	.86		.57
Problem-focused Time 2	1-4	1.08-3.25	57	2.03 (.51)	.77	.60	.18
Avoidant Coping Time 1	1-4	1.08-3.67	70	2.16 (.55)	.76		.58
Avoidant Coping Time 2	1-4	1.00-3.58	57	2.07 (.59)	.81	.77	.66
Delib. Rum. Time 1	1-4	1.40-4.00	70	3.07 (.59)	.82		-.44
Delib. Rum. Time 2	1-4	1.00-4.00	57	2.92 (.67)	.86	.65	-.86

[1] Standard error of skewness at Time 1 = .29 and standard error of skewness at Time 2 = .32

Table 3

Psychometric Properties of the Study Variables for the Non-Trauma group

Variable	Potential	Actual	*N*	*M (SD)*	α	Test Retest	Skewness[1]
PTG Time 1	1-6	1.00-5.90	87	3.44 (1.15)	.94		-.19
PTG Relate	1-6	1.00-6.00	87	3.37 (1.37)	.90		-.22
PTG Possibility	1-6	1.00-6.00	87	3.50 (1.30)	.81		-.14
PTG Personal	1-6	1.00-6.00	87	3.71 (1.29)	.82		-.38
PTG Appreciate	1-6	1.00-6.00	87	3.80 (1.53)	.83		-.31
PTG Spirit	1-6	1.00-6.00	87	2.42 (1.54)	.84		.78
PTG Time 2	1-6	1.71-5.33	58	3.50 (.99)	.91	.65	-.11
PTG Relate	1-6	1.00-5.71	58	3.48 (1.32)	.89	.68	-.05
PTG Possibility	1-6	1.00-6.00	58	3.56 (1.29)	.79	.64	-.10
PTG Personal	1-6	1.00-6.00	58	3.84 (1.16)	.72	.54	-.30
PTG Appreciate	1-6	1.00-6.00	58	3.86 (1.47)	.81	.58	-.41
PTG Spirit	1-6	1.00-6.00	58	2.22 (1.48)	.77	.71	1.13
Optimism Time 1	1-5	1.33-4.17	87	3.16 (.62)	.74	-	.63
World Beliefs Time 1	1-6	2.48-4.90	87	3.81 (.52)	.81		-.04
World Beliefs Time 2	1-6	2.77-5.06	58	3.91 (.50)	.81	.83	.00
Negative Rating	1-7	1.00-6.00	71	3.35 (1.55)	-	-	-.02
Positive Rating	1-7	1.00-7.00	83	4.29 (2.17)	-	-	-.48
Symptomatology Time 1	1-5	1.00-3.36	87	1.79 (.64)	.90		.60
Symptomatology Time 2	1-5	1.00-3.73	58	1.81 (.63)	.90	.55	.89

Table 3 Continued

Psychometric Properties of the Study Variables for the Non-Trauma group

Variable	Potential	Actual	*N*	*M (SD)*	α	Test Retest	Skewness[1]
Problem-focused Time 1	1-4	1.00-3.75	87	2.24 (.66)	.91		.10
Problem-focused Time 2	1-4	1.00-3.92	58	2.13 (.71)	.92	.73	.31
Avoidant Coping Time 1	1-4	1.00-3.25	87	1.74 (.49)	.79		.83
Avoidant Coping Time 2	1-4	1.00-3.08	58	1.73 (.48)	.80	.41	.65
Delib. Rum. Time 1	1-4	1.00-4.00	86	2.72 (.67)	.85		-.22
Delib. Rum. Time 2	1-4	1.00-3.80	58	2.75 (.65)	.86	.38	-.80

[1] Standard error of skewness at Time 1 = .26 and standard error of skewness at Time 2 = .31

Table 4

Intercorrelations Amongst Time 1 Variables in the Total Sample

	2	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1. PTG	.13	.15	.25**	.07	.07	.32***	.01	.60***
2. World Beliefs	-	-.40***	.09	-.32***	.64***	.19*	-.33***	-.05
3. Symptomatology		-	-.30***	.66***	-.39***	-.03	.61***	.42***
4. Positive Rating			-	-.60***	.10	.21**	-.11	.05
5. Negative Rating				-	-.33***	-.03	.41***	.27***
6. Optimism					-	.07	-.43***	-.18*
7. Problem-focused						-	.01	.13
8. Avoidant Coping							-	.23**
9. Delib. Rum.								-

*p<.05, **p<.01, ***p<.001

Table 5

Intercorrelations Amongst Time 1 Variables by Group

	Trauma (Non-Trauma)							
Measure	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1. PTG	.32** (.01)	-.15 (.33**)	.26 (.46***)	-.07 (-.02)	.14 (.05)	.44*** (.28**)	-.14 (.03)	.61*** (.60***)
2. World Beliefs	-	-.47*** (-.20)	.17 (-.08)	-.27* (-.12)	.56*** (.69***)	.32** (.05)	-.30** -.26*)	.09 (-.07)
3. Symptomatology		-	.11 (-.01)	.46*** (.35**)	-.52*** (-.18)	-.05 (.19)	.60*** (.43***)	.14 (.52***)
4. Positive Rating			-	-.05 (-.57***)	.11 (-.03)	.25 (.17)	.28* (-.04)	.15 (.29**)
5. Negative Rating				-	-.19 (-.24*)	.06 (.02)	.35** (.15)	-.06 (.17)
6. Optimism					-	.15 (-.04)	-.35** (-.44***)	-.18 (-.11)
7. Problem-focused						-	-.00 (.13)	.27* (.10)
8. Avoidant Coping							-	.11

Table 5 Continued

Intercorrelations Amongst Time 1 Variables by Group

	Trauma (Non-Trauma)							
Measure	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
9. Delib. Rum.								-

*p<.05, **p<.01, ***p<.001

Table 6

Intercorrelations Amongst Time 2 Variables in the Total Sample

Measure	*2*	*3*	*4*	*5*	*6*
1. PTG	.27**	-.05	.26**	<.01	.50***
2. World Beliefs	-	-.42***	.21*	-.41***	<.01
3. Symptomatology		-	-.06	.64***	.23*
4. Problem-focused			-	.09	.23*
5. Avoidant Coping				-	.23*
6. Delib. Rum.					-

*p<.05, **p<.01, ***p<.001

Table 7

Intercorrelations Amongst Time 2 Variables by Group

	Trauma (Non-Trauma)				
Measure	*2*	*3*	*4*	*5*	*6*
1. PTG	.41** (.21)	-.28* (.10)	.48*** (.13)	-.12 (.08)	.52*** (.46***)
2. World Beliefs	-	-.51*** (-.08)	.25 (.16)	-.35** (-.35**)	.06 (.02)
3. Symptomatology		-	-.08 (.03)	.66*** (.47***)	.02 (.41***)
4. Problem-focused			-	.16 (.08)	.31* (.19)
5. Avoidant Coping				-	.12 (.30*)
6. Delib. Rum.					-

*p<.05, **p<.01, ***p<.001

Table 8

Intercorrelations Amongst Time 1 and Time 2 Variables in the Total Sample

	Time 2					
Measure	PTG	World Beliefs	Symptomatology	Problem-focused	Avoidant Coping	Delib. Rum.
Time 1						
PTG	.70***	.22*	-.01	.19*	-.06	.35***
World Beliefs	.25**	.82***	-.35***	.28**	-.29***	.03
Symptomatology	.02	-.46***	.78***	-.12	.44***	.24**
Problem-focused	.30***	.12	-.04	.68***	-.02	.30***
Avoidant Coping	.03	-.43***	.56***	.08	.67***	.25**
Delib. Rum.	.38***	.01	.21*	.05	.11	.52***
Optimism	.10	.62***	-.35***	.21*	-.39***	-.08

*p<.05, **p<.01, ***p<.001

Table 9

Intercorrelations Amongst Time 1 and Time 2 Variables by Group

	Trauma (Non-Trauma) Time 2					
Measure	PTG	World Beliefs	Symptomatology	Problem-focused	Avoidant Coping	Delib. Rum.
Time 1						
PTG	.74*** (.65***)	.41** (.13)	-.24 (.11)	.37** (.09)	-.22 (.02)	.40** (.28*)
World Beliefs	.39** (.19)	.78*** (.83***)	-.43*** (-.05)	.43*** (.15)	-.21 (-.26*)	.09 (.04)
Symptomatology	-.23 (.15)	-.41*** (-.32**)	.79*** (.55***)	-.09 (-.09)	.40** (.23)	.05 (.41**)
Problem-focused	.42*** (.23)	.17 (-.01)	-.05 (.11)	.60*** (.73***)	-.04 (.10)	.38** (.26)
Avoidant Coping	-.14 (.14)	-.36** (-.36**)	.69*** (.11)	.19 (.06)	.77*** (.41***)	.08 (.38**)
Delib. Rum.	.44*** (.30*)	.23 (-.05)	<.01 (.25)	.32* (-.09)	-.03 (.12)	.65*** (.38**)
Optimism	.32* (-.07)	.55*** (.64***)	-.43** (-.09)	.25 (.16)	-.32* (-.39*)	-.05 (-.07)

*p<.05, **p<.01, ***p<.001

Differences Between the Trauma and Non-Trauma group

The first four hypotheses were related to the general prediction that participants in the Trauma group would differ from the Non-Trauma group in a number of ways. The first hypothesis was that at Time 1 and Time 2, at least some participants in the Trauma group would have higher self-ratings of growth than the Non-Trauma group. Therefore, the Trauma group would either have higher mean scores on self-rated growth, as Tedeschi and Calhoun (1996) found, and/or would have greater variability in scores. The second hypothesis was that compared to the Non-Trauma group, the Trauma group would show a greater increase in growth from Time 1 to Time 2. A significant interaction between group and timing of the growth scores was predicted, such that it was expected that for participants in the Trauma group, scores on the posttraumatic growth would be higher at Time 2 than at Time 1. This difference was not expected to occur in the Non-Trauma group.

To test these hypotheses, a 2x2 mixed analysis of variance (ANOVA) was conducted with group (trauma vs. non-trauma) as the between subjects variable and session (Time 1 vs. Time 2) as the within-subjects variable. The dependent variable was participants' posttraumatic growth scores. Shapiro-Wilks tests of normality indicated that scores on the posttraumatic growth measure at Time 1 were normally distributed in both the Trauma group, $p = .22$, and in the Non-Trauma group, $p = .27$. Scores on the posttraumatic growth measure at Time 2 were normally distributed in both the Trauma group, $p = .79$, and in the Non-Trauma group, $p = .09$. Levene's tests showed that the homogeneity of variance assumptions was not violated for posttraumatic growth scores at Time 1, $F(1, 113) = .03$, $p = .88$, nor for Time 2 scores, $F(1, 113) = .05$, $p = .83$. The mixed ANOVA did not reveal a main effect between groups on growth scores $F(1, 113) = 1.83$, $p = .18$, the timing of the growth scores $F(1,113) = .48$, $p = .49$, nor a

significant interaction between the timing of growth scores and group membership $F(1, 113) = .29$, $p = .59$. Therefore, the results did not support either hypothesis.

The third hypothesis was that the Trauma group would have higher scores on measures of symptomatology (intrusive rumination, hyper-arousal, and avoidance). Differences between the two groups on optimism, deliberate rumination, and adaptive coping strategies were also explored.

To test for differences on symptomatology, deliberate rumination, and adaptive coping strategies, 2x2 mixed analysis of variances (ANOVA's) were conducted with group (trauma vs. non-trauma) as the between-subjects variable and the timing of the symptomatology, deliberate rumination, and problem-focused coping measure (Time 1 vs. Time 2) as the within-subjects variable. In each case, a Shapiro-Wilks test was considered to examine whether scores were normally distributed at Time 1 and Time 2. With the exception of the deliberate rumination scores at Time 2 not being normally distributed in both the Trauma group, $p = .01$, and in the Non-Trauma group, $p = .01$, and for symptomatology scores at Time 1 not being normally distributed both in the Non-Trauma group ($p < .001$), and in the Trauma group, $p = .03$, and at Time 2 for the Non-Trauma group, $p = .003$, the rest of the scores were normally distributed. However, because cell sizes were all greater than 30, the mixed ANOVA was robust against the violations of normality. In addition, Levene's test was considered to examine the homogeneity of variance in each case. With the exception of problem-focused scores at Time 2, $F(1, 113) = 5.63$, $p = .02$, and symptomatology scores at both Time 1 $F(1, 113) = 4.75$, $p = .03$ and Time 2 $F(1, 113) = 5.63$, $p = .02$, homogeneity of variance was not violated.

As hypothesized, the mixed ANOVA's revealed that the Trauma group had higher scores on symptomatology ($M = 2.79$, $SD = .79$, $n = 57$) compared to the Non-Trauma group ($M = 1.80$,

SD = .61, *n* = 58), *F*(1, 113) = 66.08, *p* < .001. In addition, the Trauma group also had higher scores on the deliberate rumination measure (*M* = 3.01, *SD* = .89, *n* = 57) compared to the Non-Trauma group (*M* = 2.78, *SD* = .62, *n* = 58), *F*(1, 113) = 5.30, *p* = .02. There was no main effect between groups on problem-focused coping *F*(1, 113) = 1.38, *p* = .24.

Considering that optimism was only measured at Time 1, an independent t-test with group as the independent variable and optimism scores for Time 1 as the dependent variable was conducted. Levene's test for equality of variances was not violated *p* = .32. The results showed that the Trauma group had significantly lower ratings of optimism (*M* = 2.91, *SD* = .70, *n* = 70) compared to the Non-Trauma group (*M* = 3.16, *SD* = .62, *n* = 87), *t*(155) = -2.32, *p* = .02.

The fourth hypothesis was that growth would be correlated with symptomatology in the Trauma group, but not the Non-Trauma group. It was unclear whether the two groups would differ in the relation of challenged world beliefs to growth. Because the first year of university can be associated with upheavals in beliefs, it is possible the non-traumatized group would experience sufficient challenge to their assumptions that may promote growth; therefore, this was explored.

In terms of symptomatology, the best way of examining whether the two groups differed between symptoms and growth would have been to test whether the interaction of group and symptomatology significantly accounted for variance in the growth scores. However, the two groups differed significantly on symptomatology *r* = .63, *p* < .001 (Trauma group), and given that group and symptoms were so strongly confounded, testing an interaction term was not feasible. The alternative strategy of directly comparing the correlations was therefore used. Specifically, the web-based calculator offered by Preacher (2002) tests the difference between two independent correlation coefficients and was used to test the difference between the groups

in the correlation between symptoms and growth. The results indicated that the relation of symptoms to growth was different between these two groups, and that group membership moderated this difference. Interestingly, the direction of the relations contradicted the predictions of this study. As evident in Table 10, the Trauma group showed an inverse relation between scores on the symptomatology and growth measure, whereas the Non-Trauma group showed a positive association between the scores.

Table 10

Summary of Difference Between Groups in Correlation Between Symptoms and Growth

Measures	*Trauma*	*Non-Trauma*	*Z*	*P*
Symptomatology Time1 with PTG Time1	-.15	.33	-3.02	<.01
Symptomatology Time2 with PTG Time2	-.28	.10	-2.03	.04
Symptomatology Time1 with PTG Time2	-.23	.15	-2.01	.04

To explore whether the trauma and Non-Trauma groups differed in the relation of challenged world beliefs to growth, a simultaneous regression was conducted regressing the PTGI at Time 2 onto the Time 1 WAS, Group, and the interaction term (WAS*Group).

The results showed that overall, the predictors accounted for 10% of the variance, R^2 = .10, $F(3, 111) = 4.19$, $p = .01$. As evident in Table 11, only the WAS accounted for a significant amount of variance in growth scores at Time 2.

Table 11

Summary of Simultaneous Regression Analysis for Group Moderating World Beliefs at Time 1 and Posttraumatic Growth at Time 2

Measures	*β*	*SE B*	*t*	*Sig. (p)*	*Sr²*
Group	-.18	.18	-1.90	.06	.03
World Beliefs	-.38	.22	-3.01	<.01	.07
Group*World Beliefs	.12	.32	.95	.35	<.01

Hypotheses Applicable to the Trauma group

The following five hypotheses were relevant to the Trauma group. The first hypothesis was that posttraumatic growth would be positively related to subjective perceptions of trauma severity, symptomatology, optimism, problem-focused coping, and deliberate rumination, and negatively related to disrupted world beliefs. To test this hypothesis, Pearson r correlations were conducted followed by a simultaneous regression.

For the Pearson r correlations, the results showed that posttraumatic growth at Time 1 was positively related to Time 1 world beliefs, problem-focused coping, and deliberate rumination (Table 5), and that posttraumatic growth at Time 2 was positively associated with Time 1 world beliefs, optimism, deliberate rumination, and problem-focused coping (Table 9), Time 2 world beliefs, problem-focused coping, and deliberate rumination, and negatively associated with symptomatology (Table 7).

As expected, Time 1 scores for optimism, deliberate rumination, and problem-focused coping were positively related to posttraumatic scores at Time 2, and Time 2 scores for problem-focused coping and deliberate rumination had a positive association with posttraumatic growth scores at Time 2. Contrary to the predictions in this study, symptomatology scores at Time 1 had

no effect on growth scores at Time 2, and Time 2 scores for symptomatology had an inverse relation with posttraumatic growth scores at Time 2. Furthermore, the world beliefs measure was shown to have positive associations with the growth scores at both Time 1 and Time 2, suggesting that the WAS scale did not measure *degree* of *challenge* or *threat* to world beliefs.

A simultaneous regression was conducted regressing the Time 1 PTGI onto the scores for Time 1 symptomatology, disrupted world beliefs, optimism, problem-focused coping, and deliberate rumination. Overall, the predictors accounted for 51% of the variance, $R^2 = .51$, $F(5, 64) = 13.12$, $p < .001$. As evident in Table 12, problem-focused coping and deliberate rumination accounted for a significant amount of variance in growth scores at Time 1.

To examine whether Time 1 predictors accounted for change in posttraumatic growth, a simultaneous regression was conducted regressing the Time 2 PTGI onto the Time 1 scores for the PTGI, symptomatology, disrupted world beliefs, optimism, problem-focused coping, and deliberate rumination. Overall, the predictors accounted for 60% of the variance, $R^2 = .60$, $F(6, 50) = 12.42$, $p < .001$. As evident in Table 13, only posttraumatic growth scores at Time 1 accounted for a significant amount of variance in growth scores at Time 2.

The second hypothesis in relation to the Trauma group was that optimism would be related to problem-focused coping and deliberate rumination. As evident in Table 5, contrary to the hypothesis, optimism was not related to either variable. Only in the total sample was optimism at Time 1 negatively associated with Time 1 deliberate rumination, which was opposite of the direction predicted (see Table 4), and positively related to Time 2 problem-focused coping (see Table 8).

The third hypothesis was that post-trauma symptomatology and world beliefs would independently predict posttraumatic growth. A simultaneous regression was conducted

regressing the Time 1 PTGI scores onto the WAS and IES. Overall, the predictors accounted for 10% of the variance, $R^2 = .10$, $F(2, 67) = 3.91$, $p = .03$. As evident in Table 14, only the WAS significantly contributed independent variance in posttraumatic growth scores at Time 1.

To explore whether the WAS and IES predicted change in growth scores, a final simultaneous regression was conducted regressing the Time 2 scores for the PTGI onto the scores for the Time 1 PTGI, WAS and IES. Overall, the predictors accounted for 58% of the variance, $R^2 = .58$, $F(3, 53) = 24.19$, $p < .001$. As evident in Table 15, only posttraumatic

Table 12

Summary of Simultaneous Regression Analysis Regressing Time 1 PTGI onto Predictors

Measures	*B*	*SE B*	*T*	*Sig. (p)*	*Sr²*
Symptomatology	-.13	.15	-1.204	.23	.01
World Beliefs	.08	.21	.70	.49	<.01
Optimism	.09	.18	.79	.43	<.01
Problem-focused	.24	.18	2.46	.02	.05
Delib. Rum.	.57	.18	5.96	<.001	.27

Table 13

Summary of Simultaneous Regression Analysis Regressing Time 2 PTGI onto Time 1 Predictors Accounting for Change

Measures	*β*	*SE B*	*T*	*Sig. (p)*	*Sr²*
PTG Time1	.59	.11	4.78	<.001	.18
Symptomatology	-.08	.14	-.75	.46	<.01
World Beliefs	.08	.20	.63	.53	<.01
Optimism	.11	.17	.94	.35	<.01
Problem-focused	.12	.16	1.21	.23	.01
Delib. Rum.	.07	.20	.63	.53	<.01

Table 14

Summary of Simultaneous Regression Analysis Regressing Time 1 PTGI onto World Beliefs and Symptomatology

Measures	*β*	*SE B*	*t*	*Sig. (p)*	*Sr²*
World Beliefs	.33	.23	2.48	.02	.08
Symptomatology	.01	.18	.04	.97	<.01

Table 15

Summary of Simultaneous Regression Analysis Regressing Time 2 PTGI onto Time 1 PTGI, World Beliefs, and Symptomatology

Measures	*B*	*SE B*	*T*	*Sig. (p)*	*Sr²*
PTG Time1	.68	.08	7.26	<.001	.42
World Beliefs	.16	.17	1.58	.12	.02
Symptomatology	-.07	.13	-.75	.46	<.01

growth scores at Time 1 accounted for a significant amount of variance in growth scores at Time 2.

The fourth hypothesis was that the association between a challenged assumptive world and posttraumatic growth would be moderated by optimism. To test this hypothesis, two simultaneous regressions were conducted regressing the Time 1 PTGI scores onto the Time 1 WAS, Optimism, and the interaction (WAS*LOTR), and regressing the scores for the Time 2 PTGI onto the scores for Time 1 PTGI, WAS, optimism, and the interaction (WAS*LOTR). For Time 1, overall, the predictors accounted for 13% of the variance, $R^2 = .13$, $F(3, 66) = 3.33$, $p = .03$. However, as evident in Table 16, only the WAS significantly contributed independent variance in posttraumatic growth scores at Time 1. For Time 2, overall, the predictors accounted for 57% of the variance, $R^2 = .57$, $F(4, 52) = 17.46$, $p < .001$; however, only the Time 1 PTGI significantly contributed independent variance in posttraumatic growth scores at Time 2. See Table 17.

The final hypothesis was that problem-focused coping would mediate the moderated relation between challenged world beliefs and posttraumatic growth. However, analysis only for mediation was conducted because there was no moderation. To explore whether problem-focused coping would mediate the association between challenged world beliefs and posttraumatic growth, Baron and Kenny's (1986) procedure was used. Specifically, four conditions must be met to demonstrate mediation: (1) WAS must be significantly related to PTGI, and as evident in Table 5, it was ($r = .32$); (2) WAS must be significantly related to the mediator, and as evident in Table 5, it was ($r = .32$); (3) the mediator must be significantly related to PTGI when controlling for WAS; and (4) the relation between WAS and PTGI must be significantly reduced when controlling for the mediator. To test for the third criterion,

Table 16

Summary of Simultaneous Regression Analysis for Optimism Moderating the Relation Between Time 1 World Beliefs and Time 1 PTGI

Measures	*B*	*SE B*	*t*	*Sig. (p)*	*Sr²*
World Beliefs	-.32	.25	-2.21	.03	.06
Optimism	.14	.23	.92	.36	.01
World Beliefs*Optimism	-.19	.31	-1.35	.18	.02

Table 17

Summary of Simultaneous Regression Analysis Regressing Time 2 PTGI onto Time 1 PTGI, Optimism, World Beliefs, and the Interaction

Measures	*B*	*SE B*	*t*	*Sig. (p)*	*Sr²*
PTG Time1	.74	.08	8.04	<.001	.54
World Beliefs	-.03	.21	-.26	.80	<.01
Optimism	-.16	.16	-1.40	.17	.02
World Beliefs*Optimism	-.01	.21	-.09	.93	<.01

Table 18

Summary of Simultaneous Regression Analysis Regressing PTGI at Time 1 onto Time 1 Challenged World Beliefs and Problem-Focused Coping

Measures	*B*	*SE B*	*t*	*Sig. (p)*	*Sr²*
World Beliefs	.21	.20	1.82	.07	.04
Problem-focused	.37	.21	3.27	<.01	.12

Time 1 posttraumatic growth was regressed onto Time 1 challenged world beliefs and problem-focused coping. As evident in Table 18, problem-focused-coping was significantly related to PTGI. In addition, the WAS was no longer significantly related to PTG satisfying Baron and Kenny's final condition demonstrating mediation.

The same procedure was used to examine mediation of the change in PTGI scores. The results indicated that after controlling for PTGI at Time 1, WAS was related to PTGI at Time 2, (*partial r* = .39). However, COPE was not related to PTGI at Time 2, which indicates that problem-focused coping at Time 1 did not mediate the relation between WAS scores at Time 1, and PTGI scores at Time 2. See Table 19.

Table 19

Summary of Simultaneous Regression Analysis Regressing PTGI at Time 2 onto Time 1 PTGI, Challenged World Beliefs and Problem-Focused Coping

Measures	*B*	*SE B*	*t*	*Sig. (p)*	*Sr²*
PTG Time 1	.64	.09	6.46	<.001	.33
World Beliefs	.17	.16	1.82	.07	.03
Problem-focused	.10	.16	1.05	.30	.01

Discussion

The term posttraumatic growth was coined in 1995 by Tedeschi and Calhoun, and has since become an increasingly studied phenomenon. Posttraumatic growth refers to the extent that an individual views an aspect of his/her post-trauma outcome as positive or favourable. Tedeschi and Calhoun argue that posttraumatic growth is not a measure of global well-being, nor a temporary residual effect of trauma, but a *qualitative* change that occurs *gradually* over time, *after* confronting and struggling with a traumatic life experience. Certainly, believing one has experienced posttraumatic growth could be used as a temporary coping strategy to distract individuals from their post-trauma distress allowing them to continue with their day-to-day activities (Hobfoll et al., 2007; Maerker & Zoellner, 2004; Taylor, 1983; Zoellner & Maercker, 2006). However, according to Tedesch and Calhoun, in order for posttraumatic growth to develop into enduring change, individuals must actively think about their adverse life experience with the intention of processing and finding meaning in it. To examine this hypothesized process, this study measured posttraumatic growth twice with a 60-day interval between the measures.

The primary goal of this study was to test a mediated moderation model in which dispositional optimism was the moderator and its role was mediated by problem-focused coping. However, as discussed in more detail below, the data did not support the model. A second goal was to demonstrate that posttraumatic growth could be differentiated from maturation and normal development. For this, the findings were mixed. In this discussion section, I will begin with some general observations and then consider each hypothesis in the order listed at the end of the Introduction.

In this sample, there is evidence that posttraumatic growth (or more generally change-related growth) was not temporary. Scores for posttraumatic growth at Time 1 and Time 2 were shown to be highly correlated $r = .74$ (Trauma group) and $r = .65$ (Non-Trauma group). Moreover, a 2x2 mixed ANOVA showed that neither group had a significant difference between Time 1 and Time 2 scores of posttraumatic growth $M = 3.69$ and $M = 3.70$ (Trauma group) and $M = 3.41$ and $M = 3.50$ (Non-Trauma group). If posttraumatic growth was a short term coping tool that provided temporary relief from post-trauma distress as suggested, by McFarland and Alvaro (2000), the results would have shown either a significantly smaller correlation between Time 1 and Time 2 scores and/or a change in the mean scores. In particular, as the illusion of growth became weaker, the reported scores at Time 2 would have decreased, which was not evident in this study.

Differentiating Posttraumatic Growth From Maturation and Normal Development

Tedeschi and Calhoun (1995, 2004) argue that people can be functional while experiencing negative physiological arousal, and that growth and distress can coexist. Further, they have posited that this negative physiological arousal can promote positive psychological changes and that this process is what distinguishes posttraumatic growth from both maturation and normal development. To test the premise that posttraumatic growth was distinguishable from other types of psychological development, this study included both a trauma and Non-Trauma group. It was hypothesized that compared to the Non-Trauma group, the Trauma group would have significantly higher scores of posttraumatic growth and/or greater variability in scores.

Analysis of Variance revealed that there was no significant difference between the groups' growth scores at both Time 1 and Time 2, nor was their greater variability between the

groups' scores. These findings suggest that the distinction between posttraumatic growth and both maturation and normal development may not be as clear as proposed by Tedeschi and Calhoun (2004). However, it is important to note that some of the non-trauma participants described an experience similar to that of the participants in the Trauma group. Therefore, the lack of difference between the two groups on scores of growth could possibly be attributed to the fact that the Non-Trauma group was more similar to the Trauma group than expected.

That said, as noted below, the two groups did differ significantly on ratings of negativity and positivity of the target event, and on scores of posttraumatic symptoms. Therefore, another possible explanation for the finding that the scores on the posttraumatic growth measure were not different between the two groups is that the participants in the Non-Trauma group did in fact experience positive psychological changes; however, the changes were the result of maturation and/or normal development, rather than an adverse life experience. A large number of participants had described leaving home and attending university as a significant event in their life. This newly introduced non-traumatic life experience certainly may have initiated normal development that influenced positive psychological changes such as developing stronger and closer relationships, having newfound personal strength, or even identifying new life opportunities.

First, Tedeschi and Calhoun (2004) do not deny that maturation and normal development may be associated with some level of distress, and they do not deny that maturation and normal development could occur in one or all of the five domains of posttraumatic growth. Second, Tedeschi and Calhoun have suggested that it is also possible for positive experiences to initiate growth. For example, successfully achieving a milestone such as acquiring a graduate degree may increase confidence that leads to the development of newfound personal strength and new

life opportunities. In a sample where the Non-Trauma group is more developmentally stable, for example, an older sample, perhaps the predicted differences between the Trauma and Non-Trauma groups would be found.

However, Tedeschi and Calhoun (2004) do argue that it is an adverse life experience and a required level of distress that make posttraumatic growth distinct from others types of growth, hence the term *posttraumatic growth.* In this sample, the questionnaire failed to show this. This may be a limitation in the questionnaire in that the Posttraumatic Growth Inventory may be limited in its ability to detect nuances. In this respect, the open-ended responses might be more helpful, but it was beyond the scope of this study to conduct a full context analysis of the participants' responses.

It was hypothesized that the Trauma group would have higher scores on post-trauma symptomatology when compared to the Non-Trauma group. Essentially this hypothesis was simply a validity check on participants' self assignment to condition. A 2x2 mixed ANOVA did show at both times, compared to the Non-Trauma group, that the Trauma group had significantly higher ratings of symptoms. However, the strength of this relation complicated the testing of the next hypothesis that symptoms would be correlated with growth in the Trauma group but not the Non-Trauma group. Because of the confounding of group membership with distress, it was not reasonable to test this hypothesis by testing the significance of an interaction term. Therefore, I directly compared the correlations within each group.

While the results indicated that the correlations of symptoms to growth were different between both groups, the direction of the relations contradicted the predictions of this study. Specifically, the Trauma group showed an inverse relation between symptomatology and the growth measure, while the Non-Trauma group showed a positive association between these

measures. These findings contradicted Tedeschi and Calhoun's (2004) premise that negative physiological arousal promotes the development of posttraumatic growth and that this positive correlation is a distinguishing factor between posttraumatic growth and both maturation and normal development. There are a couple of possible explanations for these findings.

To explain the lack of positive correlation between distress and posttraumatic growth for the Trauma group, we need to consider Tedeschi and Calhoun's premise that distress is the catalyst to posttraumatic growth. They do not suggest that distress remains at consistently high levels. Rather, they postulate that distress must pass a certain threshold in order to begin the processes involved with the development of posttraumatic growth. Considering the fact that the adverse life experiences occurred between two and twenty-four months of the study, it is possible that the time interval was too long. It may be that for many participants their distress levels had previously surpassed the threshold needed to initiate the processes of posttraumatic growth, and had decreased prior to participation in the study as the process of growth concluded. Consistent with this interpretation is the relatively low means on the measure of posttraumatic symptoms (M = 2.9 and M = 2.6 respectively for Time 1 and Time 2, within a possible range of 1-5).

The positive correlation between distress and posttraumatic growth for the Non-Trauma group could be attributed to the fact that the participants had experienced enough distress to influence normal development. Specifically, many participants in the Non-Trauma group, for their significant event, described leaving home and attending university, which could provoke distress. This experience imposes new, demanding and stressful responsibilities of varying degrees. However, given that the Trauma group was also exposed to these same developmental events, why was distress not related to growth for them? Participants rated both symptoms and

growth with their specific event in mind. Had the Trauma group been asked to rate more recent significant events, perhaps they too would have shown a correlation between symptoms and growth.

Some researchers such as Janoff-Bulman (1989), Joseph and Linley (2008), Lehman et al. (1987), and Tedeschi and Calhoun (1995, 1996, 2004), have argued that distress is aroused when an adverse life experience challenges or threatens one's schemas. Schemas are broad principles that consist of malleable and more distinctive refined rules that guide our behaviour, help us to predict outcomes, and provide explanations about our daily encounters with the environment. When an experience challenges or threatens these strong beliefs, individuals may begin interpreting the event and evaluating existing schemas. This appraisal process may lead to the modification of refined rule(s), and it is in this modification process there is potential for the development of posttraumatic growth. Based on this reasoning, I explored whether there would be a differential correlation between growth and challenged world beliefs between the two groups.

A simultaneous regression was conducted to determine whether there were differences between the Trauma and Non-Trauma groups in the relation of challenged world beliefs at Time 1 to posttraumatic growth at Time 2. The results showed that the relation between world beliefs and posttraumatic growth was not dependent on group membership (see Table 12). However, calculations of bivariate correlations showed that only for the Trauma group were scores on the world beliefs scale consistently associated with scores on the posttraumatic growth scale at both Time 1 and Time 2. There were no significant correlations between world beliefs and posttraumatic growth for the Non-Trauma group (see Tables 5, 7, & 9).

Although the measure of world beliefs was correlated with growth in the Trauma group, it was in the opposite direction predicted. Specifically, it was hypothesized that scores between the WAS and posttraumatic growth would show an inverse relation, because a low score on the WAS indicates challenged beliefs; however, the results showed a positive correlation. As noted above, perhaps many of the participants in the Trauma group came into the study too late, after the process of growth was completed. Similarly, it is possible that the participants had experienced temporary threat or challenge to their world beliefs prior to the study, but sufficient time had elapsed that those people who were capable of posttraumatic growth had achieved it and as a result of that growth, now had more adaptive world beliefs than those who had not achieved growth. To test this possibility, future research would need to collect data at multiple points in time, starting very shortly after the trauma.

It has been argued by some researchers (Cann et al., 2010; Lindstrom et al., 2013; Tedeschi & Calhoun, 2004) that deliberate rumination is a critical element in developing posttraumatic growth. Intentional and purposeful thoughts about an adverse life experience are an important element because it involves the process of evaluating and interpreting the event. This constructive approach provides the opportunity for finding meaning in the experience by way of resolving, accepting, or minimizing the impact of the outcome. It is through this active process of problem-focused coping there is the potential for developing posttraumatic growth (Tedeschi & Calhoun, 1995, 2004; Triplett et al., 2012). It was hypothesized that the Trauma group would show a greater degree of deliberate rumination and problem-focused coping considering the severity of their experience compared to the Non-Trauma group.

A 2x2 mixed ANOVA did not show any differences between the trauma and Non-Trauma group on scores of problem-focused coping. Considering the types of experiences

described by both groups of participants, it was not surprising that there were similar levels of reported problem-focused coping. Working through persistently new challenges that arise from leaving home and attending university does require having the ability to solve problems, and to be able to do this effectively and efficiently.

A second 2x2 mixed ANOVA did show a main effect for group with the Trauma group having slightly but significantly higher scores on deliberate rumination (M = 3.0) compared to the Non-Trauma group (M = 2.8). This finding indicates that the nature of an experience may influence the degree to which people intentionally think about the event. Comparatively, the Trauma group were more likely to describe experiences of greater adversity as depicted in ratings of how negative the experience was (M = 5.9) compared to the participants in the Non-Trauma group (M = 3.4). Therefore, it is plausible that as a group, the trauma participants engaged in more deliberate thought about their experience when compared to the Non-Trauma group. Processing a traumatic experience requires time and effort because it involves evaluation, interpretation, and meaning-making. Therefore, it would be expected that complex events such as an adverse life experience requires a greater degree of deliberate rumination.

The last analysis conducted between the trauma and Non-Trauma group was an independent t-test to explore whether there was a significant difference between scores on optimism. The Trauma group had significantly lower ratings of optimism compared to the Non-Trauma group. As mentioned above, the Trauma group described experiences of greater adversity; therefore, it would be expected that dispositional levels of optimism decreased or at least temporarily weakened for participants in this group.

Prediction of Posttraumatic Growth

The second group of hypotheses was related to the prediction of posttraumatic growth. Because the focus was on posttraumatic growth, in most cases only analyses with the Trauma group were relevant.

Based on previous research (Büyükaşik-Çolak et al., 2012; Cann et al., 2010, 2011; Helgeson et al., 2006; Lindstrom et al., 2013; Triplett et al., 2012), it was hypothesized that several variables would be correlated with the development of posttraumatic growth: disrupted world beliefs, symptomatology, optimism, deliberate rumination, and problem-focused coping. To address this hypothesis, correlations of posttraumatic growth with all variables were calculated at Time 1, and with all variables but optimism at Time 2. In addition, the correlation of all variables at Time 1 with posttraumatic growth scores at Time 2 was examined.

At Time 1, posttraumatic growth was positively correlated, as predicted, with problem-focused coping and deliberate rumination, but was also correlated with world beliefs in the opposite direction to that predicted (see Table 5). Posttraumatic growth was associated with positive, adaptive world beliefs rather than challenged or disrupted world beliefs. However, a multiple regression predicting Time 1 posttraumatic growth, entering all variables, found that only problem-focused coping and deliberate rumination uniquely predicted growth (see Table 12). This is consistent with previous research that has found that posttraumatic growth is associated with deliberate rumination (Cann et al., 2010; Lindstrom et al., 2013; Tedeschi & Calhoun, 2004) and problem-focused coping (Büyükaşik-Çolak et al., 2012; Folkman & Lazarus, 1980; Triplett et al., 2012).

At Time 2, the same relations were observed, but in addition, symptomatology was negatively correlated with posttraumatic growth, contrary to the hypothesis (see Table 7).

The correlation of Time 1 variables with Time 2 posttraumatic growth indicated that problem-focused coping, deliberate rumination and optimism correlated in the predicted direction, while world beliefs correlated in the opposite direction to that predicted (see Table 9). However, these findings cannot be interpreted as reflecting a developmental process because when a multiple regression was calculated predicting Time 2 posttraumatic growth scores, controlling for Time 1 posttraumatic growth scores, no variable (beyond Time 1 posttraumatic growth scores) predicted Time 2 posttraumatic growth (see Table 13).

I should note that this pattern of findings also addresses my hypothesis that challenged world beliefs and symptomatology would independently predict posttraumatic growth. While it was the case that these variables functioned independently in concurrently predicting growth at Time 1 and Time 2 (with world beliefs predicting, but not symptoms), this difference was not meaningful because when Time 1 posttraumatic growth scores were included as a predictor in the regression; neither symptoms nor world beliefs accounted for change in posttraumatic growth at Time 2; only Time 1 growth scores accounted for significant variance in growth scores at Time 2.

Researchers (Helgeson et al., 2006; Lindstrom et al., 2011; Prati & Pietrantoni, 2009; Tedeschi & Calhoun, 2004; Triplett et al., 2011) have argued that deliberate rumination and problem-focused coping are needed for the development of posttraumatic growth yet, this premise was not supported in this study when controlling for Time 1 scores of posttraumatic growth. There are several possible interpretations for my findings: (1) the theory is incorrect (and therefore, prior findings were serendipitous and not replicable); (2) this sample is not representative of the population; (3) this sample is too small and there is insufficient power, and/or (4) the measures are not representative of the variables in the study.

The fact that in concurrent analyses I replicated prior findings of correlations between posttraumatic growth and both problem-focused coping and deliberate rumination, but did not find a relation with *change* in posttraumatic growth does raise the possibility that the theory is incorrect. However, it is premature to make this conclusion. The simplest reason for lack of prediction in change is that change had already occurred prior to the study, and therefore, there was no change to predict over the 60-day period. Consistent with this interpretation is the finding that Time 2 growth scores were ostensibly the same as Time 1.

Another element believed to be involved with the process of developing posttraumatic growth was optimism. Past research has shown a relation between optimism and posttraumatic growth (Büyükaşik-Çolak et al., 2012; Davis et al.,1998; Helgeson et al., 2006; Prati & Pietrantoni, 2009), and this study did show a moderate association between scores for optimism at Time 1 and scores for posttraumatic growth at Time 2. However, this correlation disappeared once Time 1 posttraumatic growth scores were controlled for, indicating that optimism was not related to change in posttraumatic growth. It was hypothesized that the strength of the association between world beliefs and posttraumatic growth would depend on the measure of optimism. Specifically, as scores of optimism increased, so would the association between world beliefs and posttraumatic growth. However, as already noted, the correlations with the WAS were in the direction opposite to that originally predicted. Moreover, the WAS was highly correlated with the measure of optimism, making an interaction term less meaningful.

The Hypothesis of Mediated-Moderation

Initially, this study was going to test a mediated-moderation model, in which problem-focused coping mediated the relation between world beliefs and posttraumatic growth, and this relation was in turn moderated by optimism. However, as mentioned earlier, the correlation

between the WAS and posttraumatic growth scale was in the opposite direction of what was expected, and furthermore, optimism did not moderate the relation between world beliefs and growth. Therefore, only an exploratory mediation model was conducted, examining whether problem-focussed coping at Time 1 mediated the relation between the WAS at Time 1 and the PTGI at both Time 1 and Time 2.

For PTGI scores at Time 1, three simultaneous regression analyses confirmed all four conditions that are needed for a full mediation, as outlined by Baron and Kenny's (1986) procedure. Scores from the world beliefs measure were associated with both posttraumatic growth and problem-focused coping, problem-focused coping was significantly related to posttraumatic growth while controlling for scores on the WAS, and the relation between world beliefs and posttraumatic growth was no longer significant when controlling for problem-focused coping. This finding suggests that problem-focused coping fully explained the relation between adaptive world beliefs and posttraumatic growth. It is plausible that having adaptive world beliefs makes it possible to adopt a problem-focused coping style. Another consideration could be that the WAS is performing as a measure of optimism, given both the high correlation between WAS and the measure of optimism (r = .56 in the Trauma group) and given that I had hypothesized that there would be a correlation between optimism and posttraumatic growth and that the relation would be mediated by problem-focused coping. However, it is also possible, given these results were not hypothesized, that these findings are spurious. Therefore, they should first be replicated. Moreover, for PTGI scores at Time 2, regression analyses showed that problem-focused coping did not mediate the relation between WAS at Time 1 and PTGI scores at Time 2.

Exploratory Hypotheses

In addition to the predictions about differences in growth between the two groups and the hypothesized mediated moderation model, two exploratory hypotheses were proposed. First, it was hypothesized that there would be sex differences amongst the variables. However, due to a lack of male participants, these hypotheses were not explored. Finally, it was hypothesized that within the Trauma group, optimism, deliberate rumination, and problem-focused coping would be related to post-trauma symptoms. Contrary to these predictions, Pearson correlations revealed only a significant inverse relation between both Time 1 optimism and post-trauma symptoms (see Table 5). Deliberate rumination and problem-focused coping at both Time 1 and Time 2 were not related neither to Time 1 nor Time 2 scores of symptomatology (see Table 7 & 9).

Summary

Overall, the results did not support many of the hypotheses in this study, including the hypothesized mediated moderation model. The results showed that there was no difference between the groups on scores of posttraumatic growth or problem-focused coping. Within both of the groups, there was no significant difference between Time 1 and Time 2 scores of posttraumatic growth. However, the Trauma group was shown to have higher reported levels of post-trauma symptomatology and deliberate rumination compared to the Non-Trauma group. For the Trauma group, the results showed that posttraumatic growth was correlated with problem-focused coping and deliberate rumination; however, these variables did not predict change in growth scores over time. Furthermore, this study failed to replicate prior findings of a positive correlation between distress and posttraumatic growth (Cann et al., 2010; Park et al., 1996). Only in the Non-Trauma group were these variables correlated. One possible explanation for the above findings is that, while the significant event was more recent for the

participants in the Non-Trauma group, for the Trauma group, the traumatic event may have occurred too long ago, preventing this study from capturing the development of posttraumatic growth because it had concluded prior to the study.

It was expected that the scores on the WAS measure would have an inverse relation with scores on the posttraumatic growth scale. Contrary to this hypothesis, the results showed positive correlations between the two measures at both Time 1 and Time 2. It is not clear whether growth leads to more adaptive worldviews, or that adaptive world views somehow facilitates growth. Measuring participants' responses shortly after an adverse life experience, and following them over time using more than two points of data collection, would provide the opportunity for explicating how the WAS and growth measure function in the developmental process of growth.

Another possible explanation for the findings is related to the validity of the WAS. The WAS measure has not been extensively used in the study of posttraumatic growth. More typically, world beliefs have been measured by means of a questionnaire developed by Cann et al. (2010) that I chose not to use because its content was clearly confounded with posttraumatic growth. It is possible that the WAS was in part performing as a measure of optimism in the face of trauma. Consistent with this possibility, it correlated very highly with the LOTR. Moreover, the findings showed moderate positive associations between scores of problem-focused coping and world beliefs at both Time 1 and Time 2, and prior research has observed a correlation between optimism and problem-focused coping (Büyükaşik-Çolak et al., 2012; Scheier et al., 1986). In the light of this research, the fact that the LOTR was shown to have no correlation with problem-focused coping in this sample, suggests that this measure too has problems, at least in this study. Therefore, these overall findings provide some support for the premise that the

World Beliefs Scale may function better than the LOTR as a measure of optimism in the face of trauma.

Contrary to Tedeschi and Calhoun's (2004) premise that distress can be a distinctive factor between posttraumatic growth and both maturation and normal development, symptomatology was shown to have a positive association with the Non-Trauma group, while having an inverse relation with the Trauma group. The latter finding was the opposite of what has been found in prior research (Cann et al., 2010; Park et al., 1996). As previously mentioned, it is plausible that the distress experienced by the participants in the Trauma group did lead to their development of posttraumatic growth, but that this study did not capture this developmental process because it had occurred prior to the study.

There is some evidence in my findings that posttraumatic growth and normal development may be more similar than implied by Tedeschi and Calhoun (2004). For example, many students would not consider attending medical school as a traumatic event, yet they would still experience distress that may lead to positive psychological changes. Tedeschi and Calhoun (1996) have shown that normal development can occur in the same domains as posttraumatic growth. Therefore, distress might not be a distinguishing factor between posttraumatic growth and normal development. In fact, the findings from this study suggest that distress is one path to developing positive psychological changes within the domains of changes described by Tedeschi and Calhoun as “posttraumatic growth”; moreover, this distress does not have to be initiated by a traumatic event. Therefore the term “posttraumatic growth” may not refer to a type of growth unique to trauma, but may simply describe the *context* of the event that led to that *type* of growth.

However, there is also evidence in this study that growth can arise by a path *other than* distress because in this study, in the Non-Trauma group, positive ratings of the significant event

correlated with growth. The causal direction of this relation is unknown because I did not collect data on variables that might explain this relation. Future studies should focus on measuring participant responses shortly following a life event using multiple points of data collection.

While the experiences reported by the groups differed in *context*, the reported levels of problem-focused coping were similar. This finding was expected considering that most of the participants were first year university students experiencing a period often characterized by developmental upheaval. Another expected finding was that the Trauma group reported slightly higher levels of deliberate rumination compared to the Non-Trauma group. It is highly possible that the context of an event influences different types and/or levels of cognitive processing. For example, experiences that influence maturation and normal development such as leaving school and attending university would certainly promote deliberate rumination; however, the degree of upheaval that is experienced following a traumatic event is too great to remedy with brief and shallow deliberate thoughts, hence the higher levels of deliberate rumination in the Trauma group.

Finally, the results did provide some support for the hypothesis that posttraumatic growth may in fact be an enduring positive psychological change. The lack of difference between growth scores at both Time 1 and Time 2 could be evidence of stable growth. If posttraumatic growth was simply an illusory coping strategy, it would be expected that there would have been a significant difference between the growth scores.

Limitations and Future Research

Need for more objective measures. To mitigate some of the biases that exist with subjective ratings of experience, future studies should include more objective measures such as ratings by significant others. Even open-ended questions that provide participants with the

opportunity to describe their growth may yield more objective indicators of growth. If the responses on the posttraumatic growth measure reflect positive psychological changes, then participants should be able to describe these favourable changes in detail. This study did include open-ended questions; however, it was not within the scope of this study to do a content analysis of these responses. However, even though the open-ended responses in this study were not coded to confirm exemplars of posttraumatic growth, a quick review of the responses indicated that many of the participants were able to provide examples of their growth when they were asked to describe any changes that may have occurred as a result of their experience. Future studies should focus on using more objective measures of growth to strengthen the results found on the posttraumatic growth scale.

Biases with retrospective responses. One commonly known issue with retrospective studies is that a participant's mood can influence his/her response. The answers provided on questionnaires may be a reflection of an individual's current state, rather than his/her state at the time of the event. This leads people to under or over estimate their reactions to the experience. Prospective studies would be able to provide more reliable results because this method controls for the lapse between the adverse life experience and the participants' responses.

Nature of the experience. Future studies should consider the *context* of the event and in the case of traumatic events, the particular type of trauma should be examined to determine whether this influences different *domains* of growth. The descriptions that people provide about their adverse life experience could be categorized into groups such as negative events (i.e., nonsexual physical violence to self, nonsexual physical violence to others, physical health of self, physical health of others) and positive events (i.e., attending medical school, becoming a

parent). Analyses could then be performed to see if there is a correlation between the *context* of the event and the *domains* of growth.

Limitation to methods. There is concern about the validity of both the WAS and the LOTR, at least for this sample. First, Pearson correlations consistently showed a strong positive relation between the WAS and LOTR, which raises the question about the validity of both measures. Future studies could perform a validity check on both the LOTR and WAS to determine which scale is a more representative measure of optimism.

Secondly, it is difficult to determine the causal direction of the relation between world beliefs and posttraumatic growth. In hindsight, a better approach would have been to study people immediately following an adverse life experience and to have collected data at more than two points to help explicate the role of assumptive world beliefs in the development of posttraumatic growth. In this study, many of the participants in the Trauma group may have completed their posttraumatic growth before they came into this study. At the very least, their scores of growth had not changed from Time 1 to Time 2; therefore, there was no change to predict over a 60-day period.

Finally, future studies should consider Latent Trajectory Modelling. Similar to the facets of the world beliefs and posttraumatic growth scales, latent modelling identifies trajectories of behaviour. Rather than having only two post-trauma outcomes, growth versus no growth, analyses using latent modelling could look at the various trajectories of trauma outcome.

Conclusion and Implications

The overall results from this study contributes new knowledge and provides support for some of the prior findings on post-trauma outcomes, especially, posttraumatic growth. While the illusion of growth can be a temporary coping mechanism used to distract one's self from distress

(Hobfoll et al., 2007; Maercker & Zoellner, 2004; Taylor, 1983; Tedeschi & Calhoun, 1995, 2004; Zoellner & Maercker, 2006), growth can also endure. Stable growth does not denote global well-being, nor the absence of post-trauma symptoms (Tedeschi and Calhoun, 1995, 2004). Therefore, while posttraumatic growth is not an indication of recovery, resilience, or symptom abatement, it is a positive or favourable change in its own right. Furthermore, the findings of this study support the premise that growth can also follow significant events that are distressing, yet not traumatic.

Clinical environments would benefit from exploring a client's potential for developing posttraumatic growth by adopting a less biomedical model. For example, assessments that focus solely on the presence and absence of symptoms are missing the opportunity to empower the clients. This symptomatic approach restricts the restorative process because it does not educate clients about how to engage in beneficial cognitive processes such as deliberate rumination and meaning-making. Furthermore, the medical model focuses only on symptom abatement, which is difficult to work towards and achieve when people are not educated on the positive ways to approach and process adverse life experiences. Despite its clichéd inflection, the following aphorism conveys the beneficial effects of empowerment: "Give a man a fish and you feed him for a day. Teach a man to fish and you feed him for a lifetime" (Chinese Proverb).

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Appendix A

Intercorrelations Amongst PTGI Subscales and Time 1 and Time 2 Variables in the Total Sample

Table 20

Intercorrelations Amongst PTGI Subscales and Time 1 and Time 2 Variables in the Total Sample

Variable	PTG Relate Time1	PTG Relate Time2	PTG Possibility Time1	PTG Possibility Time2	PTG Personal Time1	PTG Personal Time2	PTG Appreciate Time1	PTG Appreciate Time2	PTG Spirit Time1	PTG Spirit Time2
PTG Time1	.92***	.61***	.81***	.51***	.81***	.48***	.82***	.55***	.81***	.42***
PTG Time2	.69***	.90***	.45***	.70***	.55***	.78***	.52***	.78***	.57***	.45***
PTG RelateT1	-	.69***	.60***	.43***	.62***	.43***	.68***	.55***	.78***	.35***
PTG RelateT2	-	-	.29**	.44***	.41***	.59***	.42***	.68***	.55***	.42***
PTG Possibility T1	-	-	-	.60***	.70***	.33***	.69***	.24**	.50***	.16
PTG Possibility T2	-	-	-	-	.42***	.58***	.39***	.37***	.27**	.10
PTG Personal T1	-	-	-	-	-	.57***	.60***	.39***	.53***	.25**
PTG Personal T2	-	-	-	-	-	-	.34***	.55***	.31***	.10
PTG Appreciate T1	-	-	-	-	-	-	-	.49***	.64***	.31***
PTG Appreciate T2	-	-	-	-	-	-	-	-	.50***	.33***
PTG Spirit T1	-	-	-	-	-	-	-	-	-	.53***
PTG Spirit T2	-	-	-	-	-	-	-	-	-	-

Table 20 Continued

Intercorrelations Amongst PTGI Subscales and Time 1 and Time 2 Variables in the Total Sample

Variable	PTG Relate Time1	PTG Relate Time2	PTG Possibility Time1	PTG Possibility Time2	PTG Personal Time1	PTG Personal Time2	PTG Appreciate Time1	PTG Appreciate Time2	PTG Spirit Time1	PTG Spirit Time2
Optimism T1	.07	.07	.01	.03	.10	.19*	-.01	.03	.04	.09
World Beliefs T1	.18*	.23**	.10	.18	.16	.33***	.05	.13	.02	-.02
World Beliefs T2	.25**	.24**	.14	.15	.25**	.35***	.11	.26**	.13	-.10
Negative Rating	.11	.21*	-.15	-.13	-.02	-.05	.12	.33***	.14	.17
Positive Rating	.13	-.10	.49***	.30**	.19*	.06	.24**	-.14	.19*	-.18
Symptomatology T1	.09	.07	.01	-.13	.10	-.13	.19*	.17	.14	.17
Symptomatology T2	-.01	-.02	-.11	-.12	-.08	-.17	.04	.14	.05	.07
Problem-focused T1	.25**	.24**	.39***	.30***	.38***	.28**	.19*	.17	.10	.08
Problem-focused T2	.19*	.19*	.15	.23**	.24**	.34***	.07	.14	.08	.03
Avoidant Coping T1	-.04	.05	-.05	-.03	.01	.00	.06	.12	.01	-.07
Avoidant Coping T2	-.04	.05	-.09	-.00	-.11	-.05	.02	.03	.00	-.08
Delib. Rum. T1	.52***	.33***	.47***	.23*	.50***	.27**	.53***	.34***	.52***	.29**

Table 20 Continued

Intercorrelations Amongst PTGI Subscales and Time 1 and Time 2 Variables in the Total Sample

Variable	PTG Relate Time1	PTG Relate Time2	PTG Possibility Time1	PTG Possibility Time2	PTG Personal Time1	PTG Personal Time2	PTG Appreciate Time1	PTG Appreciate Time2	PTG Spirit Time1	PTG Spirit Time2
Delib. Rum. T2	.31***	.42***	.19*	.28**	.30***	.42***	.31***	.43***	.35***	.32***

*p<.05, **p<.01, ***p<.001

Appendix B

Demographic Questionnaire

Thank you for agreeing to participate in this research. Scientific journals require researchers to provide basic descriptions of participants, so that other scientists can judge how well the results will generalize to others. We would therefore appreciate receiving the following information about you:

Sex
- ❍ Male
- ❍ Female
- ❍ Other

Age

Major Area of Study

Citizenship Status
- ❍ Canadian
- ❍ Landed Immigrant
- ❍ Visitor Visa
- ❍ Other

To which cultural/ethnic/racial group do you belong?

Please indicate which of the following best describes your experience:
- ❍ I HAVE HAD a profoundly upsetting experience at some point in my life
- ❍ I have NEVER had a profoundly upsetting experience in my life
- ❍ I do not know or I am unsure

When did the most recent profoundly upsetting experience occur?
- ❍ Less than 2 months ago
- ❍ At least 2 months ago, but no more than 2 years ago
- ❍ More than 2 years ago

Appendix C

World Assumptions Scale (WAS)

Below is a list of views that people have about how the world works. Please read each item, and indicate how true each statement is about your world beliefs.

Misfortune is least likely to strike worthy, decent people.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

People are naturally unfriendly and unkind.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

Bad events are distributed to people at random.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

Human nature is basically good.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

The good things that happen in this world far outnumber the bad.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

The course of our lives is largely determined by chance.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

Generally, people get what they deserve in this world.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

I often think I am no good at all.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

There is more good than evil in this world.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

I am basically a lucky person.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

People's misfortunes result from mistakes that they have made.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

People don't really care what happens to the next person.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

I usually behave in ways that are likely to maximize good results for me.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

People will experience good fortune if they themselves are good.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

Life is too full of uncertainties that are determined by chance.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

When I think about it, I consider myself very lucky.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

I almost always make an effort from preventing bad things from happening to me.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

I have a low opinion of myself.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

By and large, good people get what they deserve in this world.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

Through our actions, we can prevent bad things from happening to us.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

Looking at my life, I realized that chance events have worked out well for me.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

If people took preventative actions, most misfortune could be avoided.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

I take the actions necessary to protect myself against misfortune.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

In general, life is mostly a gamble.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

The world is a good place.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

People are basically kind and helpful.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

I usually behave so as to bring about the greatest good for me.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

I am very satisfied with the kind of person that I am.

- ❍ I disagree completely
- ❍ I disagree to a small degree
- ❍ I am neutral
- ❍ I agree somewhat
- ❍ I agree to a small degree
- ❍ I agree completely

Appendix D

Life Orientation Test - Revised (LOT-R)

Please answer the following questions about yourself by indicating the extent of your agreement to each of the questions.

In uncertain times, I usually expect the best.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neutral
- ❍ Agree
- ❍ Strongly Agree

It's easy for me to relax.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neutral
- ❍ Agree
- ❍ Strongly Agree

If something can go wrong for me, it will.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neutral
- ❍ Agree
- ❍ Strongly Agree

I'm always optimistic about my future.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neutral
- ❍ Agree
- ❍ Strongly Agree

I enjoy my friends a lot.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neutral
- ❍ Agree
- ❍ Strongly Agree

It's important for me to keep busy.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neutral
- ❍ Agree
- ❍ Strongly Agree

I hardly ever expect things to go my way.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neutral
- ❍ Agree
- ❍ Strongly Agree

I don't get upset too easily.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neutral
- ❍ Agree
- ❍ Strongly Agree

I rarely count on good things happening to me.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neutral
- ❍ Agree
- ❍ Strongly Agree

Overall, I expect more good things to happen to me than bad.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neutral
- ❍ Agree
- ❍ Strongly Agree

Appendix E

Coping Scale (COPE)

Below is a list of various ways that people use to cope with their every day experiences. Please read each item and rate how true each statement is for you.

I turn to work or other substitute activities to take my mind off things.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I concentrate my efforts on doing something about it.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I say to myself "this isn't real."
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I admit to myself that I can't deal with it, and quit trying.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I keep myself from getting distracted by other thoughts or activities.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I daydream about things other than this.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I make a plan of action.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I just give up trying to reach my goal.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I take additional action to try to get rid of the problem.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I refuse to believe that it has happened.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I sleep more than usual.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I try to come up with a strategy about what to do.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I focus on dealing with this problem, and if necessary let other things slide a little.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I give up the attempt to get what I want.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I think about how I might best handle the problem.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I pretend that it hasn't really happened.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I try hard to prevent other things from interfering with my efforts at dealing with this.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I go to movies or watch TV, to think about it less.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I take direct action to get around the problem.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I reduce the amount of effort I'm putting into solving the problem.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I put aside other activities in order to concentrate on this.
- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I think hard about what steps to take.

- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I act as though it hasn't even happened.

- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

I do what has to be done, one step at a time.

- ❍ I usually don't do this at all
- ❍ I usually do this a little bit
- ❍ I usually do this a medium amount
- ❍ I usually do this a lot

Appendix F

Deliberate Rumination

After an experience like the one you reported, people sometimes, but not always, deliberately and intentionally spend time thinking about their experience. Indicate for the following items how often, if at all, you deliberately spent time thinking about the event.

I thought about whether I could find meaning from my experience.
- ❍ I never experienced this thought
- ❍ I rarely experienced this thought
- ❍ Sometimes I experienced this thought
- ❍ I often experienced this thought

I thought about whether changes in my life have come from dealing with my experience.
- ❍ I never experienced this thought
- ❍ I rarely experienced this thought
- ❍ Sometimes I experienced this thought
- ❍ I often experienced this thought

I forced myself to think about my feelings about my experience.
- ❍ I never experienced this thought
- ❍ I rarely experienced this thought
- ❍ Sometimes I experienced this thought
- ❍ I often experienced this thought

I thought about whether I have learned anything as a result of my experience.
- ❍ I never experienced this thought
- ❍ I rarely experienced this thought
- ❍ Sometimes I experienced this thought
- ❍ I often experienced this thought

I thought about whether the experience has changed my beliefs about the world.
- ❍ I never experienced this thought
- ❍ I rarely experienced this thought
- ❍ Sometimes I experienced this thought
- ❍ I often experienced this thought

I thought about what the experience might mean for my future.
- ❍ I never experienced this thought
- ❍ I rarely experienced this thought
- ❍ Sometimes I experienced this thought
- ❍ I often experienced this thought

I thought about whether my relationship with others has changed following my experience.

- ❍ I never experienced this thought
- ❍ I rarely experienced this thought
- ❍ Sometimes I experienced this thought
- ❍ I often experienced this thought

I forced myself to deal with my feelings about the event.

- ❍ I never experienced this thought
- ❍ I rarely experienced this thought
- ❍ Sometimes I experienced this thought
- ❍ I often experienced this thought

I deliberately thought about how the event had affected me.

- ❍ I never experienced this thought
- ❍ I rarely experienced this thought
- ❍ Sometimes I experienced this thought
- ❍ I often experienced this thought

I thought about the event and tried to understand what happened.

- ❍ I never experienced this thought
- ❍ I rarely experienced this thought
- ❍ Sometimes I experienced this thought
- ❍ I often experienced this thought

Appendix G

Impact of Events Scale Revised (IES-R) - Significant Experience

Below is a list of difficulties people sometimes have after upsetting life experiences. Please read each item, and in terms of the experience you just described, please indicate how distressing it was for you (if at all)

Any reminder brings back feelings about it.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I have trouble staying asleep.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

Other things keep making me think about it.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I feel irritable and angry.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I avoid letting myself get upset when I think about it or am reminded of it.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I think about it when I don't mean to.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I feel as if it hasn't happened or isn't real.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I stay away from reminders about it.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

Pictures about it pop into my mind.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I am jumpy and easily startled.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I try not to think about it.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I am aware that I still have a lot of feelings about it, but I don't deal with them.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

My feelings about it are kind of numb.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I find myself acting or feeling as though I am back at that time.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I have trouble falling asleep.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I have waves of strong feelings about it.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I try to remove it from my memory.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I have trouble concentrating.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

Reminders of it cause me to have physical reactions, like sweating or a pounding heart.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I have dreams about it.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I feel watchful or on-guard.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I try not to talk about it.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

Appendix H

Impact of Events Scale Revised (IES-R) - Profoundly Upsetting Experience

Below is a list of difficulties people sometimes have after upsetting life experiences. Please read each item, and in terms of the experience you just described, please indicate how distressing it was for you.

Any reminder brings back feelings about it.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I have trouble staying asleep.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

Other things keep making me think about it.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I feel irritable and angry.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I avoid letting myself get upset when I think about it or am reminded of it.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I think about it when I don't mean to.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I feel as if it hasn't happened or isn't real.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I stay away from reminders about it.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

Q131 Pictures about it pop into my mind.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I am jumpy and easily startled.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I try not to think about it.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I am aware that I still have a lot of feelings about it, but I don't deal with them.

- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

My feelings about it are kind of numb.

- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I find myself acting or feeling as though I am back at that time.

- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I have trouble falling asleep.

- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I have waves of strong feelings about it.

- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I try to remove it from my memory.

- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I have trouble concentrating.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

Reminders of it cause me to have physical reactions, like sweating or a pounding heart.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I have dreams about it.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I feel watchful or on-guard.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

I try not to talk about it.
- ❍ Not At All
- ❍ A Little
- ❍ Moderate
- ❍ Quite
- ❍ Very

Appendix I

Posttraumatic Growth Inventory (PTGI) - Significant Experience

In terms of how the most significant experience that you have described affects you, please indicate for each of the statements below the degree to which this change has occurred in your life as a result of this significant experience

I have changed my priorities about what is important in life.

- ❍ I did not experience this change as a result of my significant experience
- ❍ I experienced this change to a very small degree as a result of my significant experience
- ❍ I experienced this change to a small degree as a result of my significant experience
- ❍ I experienced this change to a moderate degree as a result of my significant experience
- ❍ I experienced this change to a great degree as a result of my significant experience
- ❍ I experienced this change to a very great degree as a result of my significant experience

I have a greater appreciation for the value of my own life.

- ❍ I did not experience this change as a result of my significant experience
- ❍ I experienced this change to a very small degree as a result of my significant experience
- ❍ I experienced this change to a small degree as a result of my significant experience
- ❍ I experienced this change to a moderate degree as a result of my significant experience
- ❍ I experienced this change to a great degree as a result of my significant experience
- ❍ I experienced this change to a very great degree as a result of my significant experience

I have developed new interests.

- ❍ I did not experience this change as a result of my significant experience
- ❍ I experienced this change to a very small degree as a result of my significant experience
- ❍ I experienced this change to a small degree as a result of my significant experience
- ❍ I experienced this change to a moderate degree as a result of my significant experience
- ❍ I experienced this change to a great degree as a result of my significant experience
- ❍ I experienced this change to a very great degree as a result of my significant experience

I have a greater feeling of self-reliance.

- ❍ I did not experience this change as a result of my significant experience
- ❍ I experienced this change to a very small degree as a result of my significant experience
- ❍ I experienced this change to a small degree as a result of my significant experience
- ❍ I experienced this change to a moderate degree as a result of my significant experience
- ❍ I experienced this change to a great degree as a result of my significant experience
- ❍ I experienced this change to a very great degree as a result of my significant experience

I have a better understanding of spiritual matters.

- ❍ I did not experience this change as a result of my significant experience
- ❍ I experienced this change to a very small degree as a result of my significant experience
- ❍ I experienced this change to a small degree as a result of my significant experience
- ❍ I experienced this change to a moderate degree as a result of my significant experience
- ❍ I experienced this change to a great degree as a result of my significant experience
- ❍ I experienced this change to a very great degree as a result of my significant experience

I more clearly see that I can count on people in times of trouble.

- ❍ I did not experience this change as a result of my significant experience
- ❍ I experienced this change to a very small degree as a result of my significant experience
- ❍ I experienced this change to a small degree as a result of my significant experience
- ❍ I experienced this change to a moderate degree as a result of my significant experience
- ❍ I experienced this change to a great degree as a result of my significant experience
- ❍ I experienced this change to a very great degree as a result of my significant experience

I have established a new path for life.

- ❍ I did not experience this change as a result of my significant experience
- ❍ I experienced this change to a very small degree as a result of my significant experience
- ❍ I experienced this change to a small degree as a result of my significant experience
- ❍ I experienced this change to a moderate degree as a result of my significant experience
- ❍ I experienced this change to a great degree as a result of my significant experience
- ❍ I experienced this change to a very great degree as a result of my significant experience

I have a greater sense of closeness with others.

- ❍ I did not experience this change as a result of my significant experience
- ❍ I experienced this change to a very small degree as a result of my significant experience
- ❍ I experienced this change to a small degree as a result of my significant experience
- ❍ I experienced this change to a moderate degree as a result of my significant experience
- ❍ I experienced this change to a great degree as a result of my significant experience
- ❍ I experienced this change to a very great degree as a result of my significant experience

I am more willing to express my emotions.

- ❍ I did not experience this change as a result of my significant experience
- ❍ I experienced this change to a very small degree as a result of my significant experience
- ❍ I experienced this change to a small degree as a result of my significant experience
- ❍ I experienced this change to a moderate degree as a result of my significant experience
- ❍ I experienced this change to a great degree as a result of my significant experience
- ❍ I experienced this change to a very great degree as a result of my significant experience

Appendix J

Posttraumatic Growth Inventory (PTGI) - Profoundly Upsetting Experience

In terms of how the profoundly upsetting experience affects you, please indicate for each of the statements below the degree to which this change has occurred in your life as a result of your experience.

I have changed my priorities about what is important in life.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I have a greater appreciation for the value of my own life.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I have developed new interests.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I have a greater feeling of self-reliance.

- ❍ I did not experience this change as a result of my profoundly upsetting experience

- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I have a better understanding of spiritual matters.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I more clearly see that I can count on people in times of trouble.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I have established a new path for life.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience

- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I have a greater sense of closeness with others.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I am more willing to express my emotions.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I know better that I can handle difficulties.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I am able to do better things with my life.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I am better able to accept the way things work out.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I can better appreciate each day.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

New opportunities are available which would not have been otherwise.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience

- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I have more compassion for others.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I put more effort into my relationships.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I am more likely to try and change things that need changing.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I have a stronger religious faith.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I have discovered that I am stronger than I thought I was.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I have learned a great deal about how wonderful people are.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

I better accept needing others.

- ❍ I did not experience this change as a result of my profoundly upsetting experience
- ❍ I experienced this change to a very small degree as a result of my profoundly upsetting experience
- ❍ I experienced this change to a small degree as a result of my profoundly upsetting experience

❍ I experienced this change to a moderate degree as a result of my profoundly upsetting experience
❍ I experienced this change to a great degree as a result of my profoundly upsetting experience
❍ I experienced this change to a very great degree as a result of my profoundly upsetting experience

Appendix K

Significant Life Events Scale-Short Form (SLEF-SF)

Please estimate the number of times in your life you have experienced each event. If you have never experienced the event, please place a 0 beside that specific event.

I have witnessed or experienced a natural disaster; like a hurricane or earthquake.

I have witnessed or experienced a human made disaster like a plane crash or industrial disaster.

I have witnessed or experienced a serious accident or injury.

I have witnessed or experienced chemical or radiation exposure happening to me, or a close friend, or a family member. (Do not include routine x-ray examinations unless those deeply concern you.)

I have witnessed or experienced a life threatening illness happening to me, a close friend, or a family member.

I have witnessed or experienced the death of my spouse or child.

I have witnessed or experienced the death of a close friend or family member (other than my spouse or child).

I or a close friend or family member has been kidnapped or taken hostage.

I or a close friend or family member has been the victim of a terrorist attack or torture.

I have been involved in combat or a war or lived in a war affected area.

I have seen or handled dead bodies other than at a funeral.

I have felt responsible for the serious injury or death of another person.

I have witnessed or been attacked with a weapon other than in combat or family setting.

As a child/teen I was hit, choked, or pushed hard enough to cause injury.

As an adult, I was hit, choked, or pushed hard enough to cause injury.

As an adult or child, I have witnessed someone else being choked, hit, or pushed hard enough to cause injury.

As a child/teen I was forced to have unwanted sexual contact.

As an adult I was forced to have unwanted sexual contact.

As a child or adult I have witnessed someone else being forced to have unwanted sexual contact.

I have witnessed or experienced an extremely stressful event not already mentioned. Please explain:

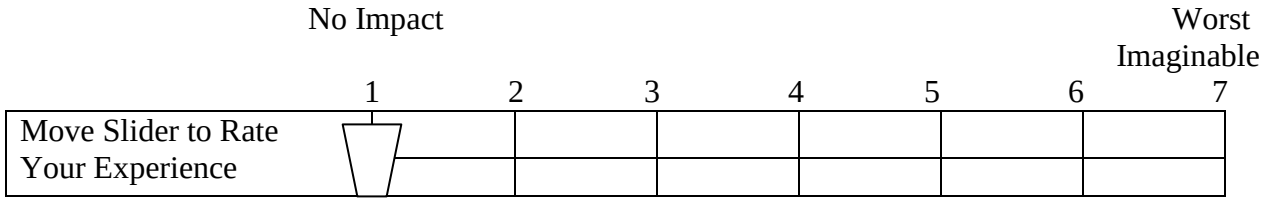
Appendix L

Questions about Significant Experience

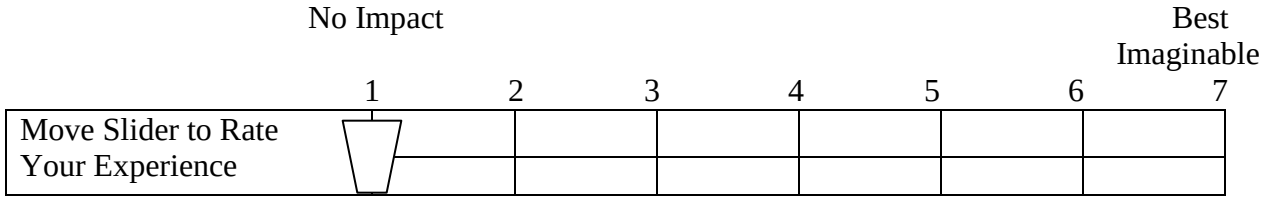
Please tell us about the most significant experience that you have had between the last 2-24 months. (Experience should have occurred at least 2 months ago, but no more than 2 years ago)

When did this experience happen? Please provide the timeframe in months. (For example, if the event happened exactly one year from this month, write 12 months).

Overall, how bad was your experience (however you would describe “bad”, whether stressful, upsetting, hurtful, shocking, etc)?



Overall, how good was your experience (however you would describe "good")?



How does that experience affect you now? Please be as specific as possible, and where possible give concrete examples.

Has the experience had any positive effect on you? If yes, please describe and be as specific as possible, and where possible, give concrete examples.

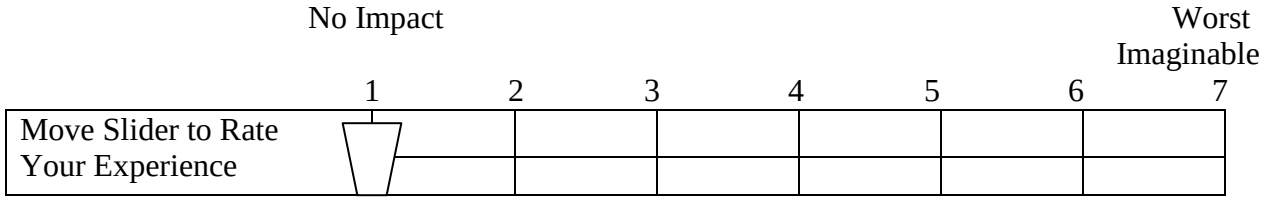
Appendix M

Questions about Profoundly Upsetting/Traumatic Experience

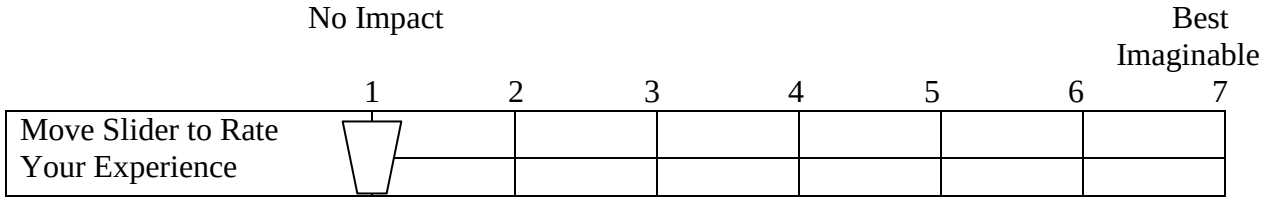
Please tell us about the most profoundly upsetting or traumatic experience that you have had between the last 2-24 months. (Experience should have occurred at least 2 months ago, but no more than 2 years ago)

When did this experience happen? Please provide the timeframe in months. (For example, if the event happened exactly one year from this month, write 12 months).

Overall, how bad was your experience (however you would describe “bad”, whether stressful, upsetting, hurtful, shocking, etc)?



Overall, how good was your experience (however you would describe "good")?



How does that experience affect you now? Please be as specific as possible, and where possible give concrete examples.

Has the experience had any positive effect on you? If yes, please describe and be as specific as possible, and where possible, give concrete examples.

Appendix N

Feedback Questionnaire

We are always looking to improve our research and questionnaires. Therefore, we would appreciate you giving us any feedback that you may have about any aspect of the study.

We would also be interested in knowing what you think we may find in this study?

Appendix O

Consent Form - Time 1

INFORMED CONSENT
Please read this form carefully and then indicate at the end whether or not you consent to participate in the study.
Project Title: Life Changes During Early Adulthood

Principal Investigator (PI): Dr. Kathryn Belicki
Department of Psychology
Brock University
kbelicki@brocku.ca

Student Principal Investigator (SPI): TinaMarie Hardman, MA Candidate
Department of Psychology
Brock University
th06om@brocku.ca

INVITATION
You are invited to participate in a study that involves research. The purpose of this research is to study life changes during early adulthood, and the impact of prior experiences on those changes. If you are a student in PSYC 1F90 or 1F25, one of the investigators is your professor. We want to assure you that there is no penalty associated with your decision to participate or to not participate in this study. For example, your decision will not affect your status in the course.

WHAT'S INVOLVED
This study involves completing questionnaires online. As a participant you will be asked to provide general demographic variables, such as age and sex. Following these general questions, you will be asked to complete two questionnaires about your general beliefs about the world, followed by questionnaires about the most significant event in the past two years and how it has affected you. You will be asked to briefly describe that event. If you belong to the group who has experienced a profoundly upsetting event, we will ask that this be the event that you describe and focus on when answering questionnaires. In addition, you will also be given a checklist of stressful life experiences and asked to indicate the number of times in your life you have experienced each event. This questionnaire includes events such as disasters, violence, and childhood abuse.

Once you have completed the online questionnaires, you will receive an online debriefing letter, which will include a copy of this consent form that can be saved onto your computer or portable stick. Two months later, another link will be sent to your student email address asking you to complete a brief set of questionnaires.

The first and second session will require approximately 60 minutes to complete. If you are a student in PSYC 1F90, and if you complete both sessions, as compensation for participation, you will be given one hour of course credit for the first session and one hour of course credit for the second. If you complete only part of the study, you will receive partial credit for the portion that you completed.

POTENTIAL BENEFITS AND RISKS

Possible benefits of participation include (a) the opportunity to reflect on changes that you have experienced and will experience in the coming months, and to perhaps gain insight into how these have affected you positively and/or negatively; and (b) the satisfaction of knowing that your data are contributing to and expanding our knowledge about how young adults change over time and how prior experience affects such changes.

There also may be risks associated with participation. Because you may be thinking about an upsetting experience, you may feel upset. However, we do not ask intrusive questions, and questions directly about the experience itself are open-ended and you may provide as little or as much detail as feels right to you.

If at any time you do not want to continue with your participation, you are welcome to simply leave the session.

At the conclusion of the session, after the last questionnaire, you will be provided with a list of counseling services that can be saved onto your computer or portable stick in case you wish to discuss the experience and the impact it has had on you.

If you leave a session before it is completed, you may return to complete it up to 72 hours after you begin the study. If after 72 hours you have not completed the session, we will email you a copy of the materials you would have received had you completed the study (including a list of counseling services). In that email we will ask you whether you would like us to delete your data. If you answer and say you would like your data withdrawn, we will remove it; otherwise, we will retain it for partial analyses. Only people who complete the first session within 72 hours will be contacted for participation in the second session.

If you do complete a session, but later decide you would rather withdraw your data, we can do this until data collection is completed. Simply email either of the investigators at the addresses provided in this form. After the study is completed, all email addresses will be erased and thereafter your data will be anonymous and cannot be removed.

CONFIDENTIALITY

All information you provide will be kept confidential. After data collection for the entire study is complete, your email address will be deleted and thereafter your data will be anonymous. We may quote from any open-ended responses in professional presentations and publications, but if we do, we will remove any information that might reveal your identity. However, most of our analyses will be focusing on group trends, not individual responses.

The data will be kept for ten years after publication of the study (as required by many journals), at which point in time it will be shredded erased/deleted. Access to this data will be restricted to researchers in Dr. Kathryn Belicki's research group.

Our online survey software is housed on a US server and is therefore subject to the Homeland Security and the Patriot Act.

VOLUNTARY PARTICIPATION

Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. You may decide to withdraw from this study at any time and may do so without any penalty or loss of benefits to which you are entitled.

PUBLICATION OF RESULTS

Results of this study may be published in professional journals and presented at conferences. Feedback about this study will be available from Tina Hardman by mid-summer. If you would like feedback about the results, please email her at th06om@brocku.ca**.**

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please contact Tina Hardman at th06om@brocku.ca or Dr. Kathryn Belicki at kbelicki@brocku.ca. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University (file# 13-058). If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I understand that I may ask questions in the future. I understand that I may withdraw this consent at any time, up until the end of data collection. However, I also understand I will be unable to withdraw my data from the study once all data has been collected, due to the fact that all data will be anonymous at that point.

○ Yes
○ No

Appendix P

Consent Form - Time 2

INFORMED CONSENT

Please read this form carefully and then indicate at the end whether or not you consent to participate in the study.

Project Title: Life Changes During Early Adulthood

Principal Investigator (PI): Dr. Kathryn Belicki
Department of Psychology
Brock University
kbelicki@brocku.ca

Student Principal Investigator (SPI): Tina Marie Hardman, MA Candidate
Department of Psychology
Brock University
th06om@brocku.ca

INVITATION

You are invited to participate in a study that involves research. The purpose of this research is to study life changes during early adulthood, and the impact of prior experiences on those changes. If you are a student in PSYC 1F90 or 1F25, one of the investigators is your professor. We want to assure you that there is no penalty associated with your decision to participate or to not participate in this study. For example, your decision will not affect your status in the course.

WHAT'S INVOLVED

As a returning participant for this study, you will be asked to complete questionnaires regarding the experience you described in the last session as well as regarding the most significant experience you have had in the last two months.

The second session will require approximately 60 minutes to complete. If you are a student in PSYC 1F90, and you complete this session, as compensation for participation, you will be given one hour of course credit. If you complete only part of the study, you will receive partial credit for the portion that you completed.

POTENTIAL BENEFITS AND RISKS

Possible benefits of participation include (a) the opportunity to reflect on changes that you have experienced and will experience in the coming months, and to perhaps gain insight into how these have affected you positively and/or negatively; and (b) the satisfaction of knowing that your data are contributing to and expanding our knowledge about how young adults change over time and how prior experience affects such changes.

There also may be risks associated with participation. Because you may be thinking about an upsetting experience, you may feel upset. However, we do not ask intrusive questions, and questions directly about the experience itself are open-ended and you may provide as little or as much detail as feels right to you.

If at any time you do not want to continue with your participation, you are welcome to simply leave the session without consequence.

At the conclusion of the session, after the last questionnaire, you will be provided with a list of counseling services that can be saved onto your computer or portable stick in case you wish to discuss the experience and the impact it has had on you.

If you leave a session before it is completed, you may return to complete it up to 72 hours after you begin the study. If after 72 hours you have not completed the session, we will email you a copy of the materials you would have received had you completed the study (including a list of counseling services). In that email we will ask you whether you would like us to delete your data. If you answer and say you would like your data withdrawn, we will remove it; otherwise, we will retain it for partial analyses.

If you do complete a session, but later decide you would rather withdraw your data, we can do this until data collection is completed. Simply email either of the investigators at the addresses provided in this form. After the study is completed, all email addresses will be erased and thereafter your data will be anonymous and cannot be removed.

CONFIDENTIALITY

All information you provide will be kept confidential. After data collection for the entire study is complete, your email address will be deleted and thereafter your data will be anonymous. We may quote from any open-ended responses in professional presentations and publications, but if we do, we will remove any information that might reveal your identity. However, most of our analyses will be focusing on group trends, not individual responses.

The data will be kept for ten years after publication of the study (as required by many journals), at which point in time it will be shredded erased/deleted. Access to this data will be restricted to researchers in Dr. Kathryn Belicki's research group.

Our online survey software is housed on a US server and is therefore subject to the Homeland Security and the Patriot Act.

VOLUNTARY PARTICIPATION

Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. You may decide to withdraw from this study at any time and may do so without any penalty or loss of benefits to which you are entitled.

PUBLICATION OF RESULTS

Results of this study may be published in professional journals and presented at conferences. Feedback about this study will be available from Tina Hardman by mid-summer. If you would like feedback about the results, please email her at th06om@brocku.ca**.**

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please contact Tina Hardman at th06om@brocku.ca or Dr. Kathryn Belicki at kbelicki@brocku.ca. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University (file# 13-058). If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I understand that I may ask questions in the future. I understand that I may withdraw this consent at any time, up until the end of data collection. However, I also understand I will be unable to withdraw your my data from the study once all data has been collected, due to the fact that all data will be anonymous at this point.

- ○ Yes
- ○ No

Appendix Q

Thank You Message With Copy of Consent Form and Debriefing Letter For Time 1

Thank you for completing phase 1 of the "Changes During Early Adulthood" study. You will receive 1 hour of course credit within 72 hours. Also, you will receive another link for phase 2 of this study in approximately 60 days. You will also receive an additional 1 hour of course credit after you have completed the questionnaires for phase 2. Below is a copy of the consent form, debrief letter, and list of counselling services that can be downloaded or saved.

Consent Form 1
Debrief Letter with Counselling Services 1

Appendix R

Thank You Message With Copy of Consent Form and Debriefing Letter For Time 2

Thank you for participating in the second session of the "Life Changes During Early Adulthood" research study. You will receive 1 hour of course credit within 72 hours.
Below is a copy of your consent form, debriefing letter, and list of counselling services that can be downloaded for your personal reference.

Consent Form 2
Debrief Letter 2 with Counselling Services

Appendix S

Ineligible Response Message - 15 Minutes Credit

Thank you for your interest in the "Changes During Early Adulthood" study. Unfortunately, you do not meet the criteria for participating in this study. You will receive 15 minutes of course credit within 72 hours. Below is a copy of the consent form and list of counselling services that can be downloaded or saved.

Consent Form 1
Debrief Letter 1 with Counselling Services

Appendix T

Ineligible Response Message - No to Consent Form 1

Thank you for your interest in this study. You will be given 15 minutes of course credit within 72 hours. Below is a copy of your consent form and list of counselling services that can be downloaded for your personal reference.

Consent Form 1
Debrief Letter 1 with Counselling Services

Appendix U

Ineligible Response Message - No to Consent Form 2

Thank you for your interest in this study. You will be given 15 minutes of course credit within 72 hours. Below is a copy of your consent form and list of counselling services that can be downloaded for your personal reference.

Consent Form 2
Debrief Letter 2 with Counselling Services

Appendix V

Debrief Letter Time 1

Debriefing Letter

Dear Participant,

We would like to thank you for sharing your experiences with us and would like to take a moment to explain the general purposes of the study. As you can see from the questionnaires, we are interested in the positive and negative effects of significant experiences. This has been previously studied quite a bit by ourselves and by others; one of the unique things of *this* study is that we are looking at how the effects of such experiences unfold over time. That is why we wanted you to focus on an experience that happened at least two months ago. That is also why we hope you will take part in the second half of the study, which will occur in two months.

Should you want to further discuss the experience and how it affects you, Brock University offers confidential, personal counselling that is free of charge. This service is located in the Schmon Tower (ST400), and is available by appointment Monday to Friday 8:30am to 4:30pm. The contact information for this service is on the attached sheet as well as a list of local services.

If you have any questions about the research please feel free to contact us. Our contact information is listed below as well as on the copy of the consent form that is also included with this letter.

Thank you again for sharing your experiences and helping with our research. At the completion of the study we will be happy to describe the study in more detail and also share our findings if you are interested in knowing about those.

Tina Hardman, th06om@brocku.ca
Kathryn Belicki, kbelicki@brocku.ca

Resources for Counselling

If you are in PSYC 1F90 or 1F25 you may have seen a copy of these resources in your course manual. If you or someone you know would like to talk about an upsetting experience, these resources are both private and confidential.

The inside of every Bell phone book lists emergency and crisis numbers, including those for phone help lines, women's centres, sexual assault centres, etc.

For *Niagara*, those numbers are:

Distress Line (Distress Centre of Niagara, St. Catharines number)	**905-688-3711**
Niagara Region Sexual Assault Centre	**905-682-4584**
Women's Place (St. Catharines)	**905-684-8331**

To see a Counsellor, here are some local resources:

Brock University Personal Counselling Services	**905-688-5550**
	Ext 4750 (to book an appointment)
	Ext 3240 (in a crisis situation)
St. Catharines General Hospital	
Mental Health Outpatient	**905-684-7271, Ext. 46440**
Sexual Assault Treatment	**905-684-7271, Ext. 45300**

The Yellow Pages list many other psychotherapists with varying training and area of specialty, and also lists some of the major resources for community support and self-help support. There are a number of categories in the Yellow Pages that are relevant. If you look under "Counselling Services" you will find a list of the various categories. If you would like to see a registered psychologist in private practice, most are listed in the Yellow Pages under "Psychologists".

In addition, depending on your circumstance(s) the following may be relevant to you….

Are you concerned that a child is being abused?

Contact the Family and Children's Services office in the area the child lives.

In Niagara, the number is **905-937-7731.**

Is it an emergency (i.e., you have good reason to believe that someone is about to hurt or kill themselves or another)?

If the person will listen to you, persuade them to:

1) call their psychotherapist, if they are already in counselling, or psychiatrist if they are under the care of a psychiatrist, or

2) go see their family physician immediately (during office hours) or

3) go to the Emergency room of a hospital.

In the case of seeing their family physician or going to Emergency, if possible, go with them. Sometimes in these contexts, one has to be persuasive about the severity of the crisis, and the hurting individual may not be in a position to advocate for themselves in this way. If they will not take your advice, call the police. Be prepared to explain in detail why you are concerned. The police have the authority to take a person to a hospital for observation, but will only do this if you are able to convince them there is a real risk for injury. However, even if you are unable to convince them, at least you will know that you have done what you could.

Appendix W

Debrief Letter - Time 2

Debriefing Letter-2nd session

Dear Participant,

We would like to thank you for sharing your experiences with us and want to take a moment to explain the purposes of the study in more detail. We are examining the effects of significant events, including very stressful experiences, with an emphasis on the positive changes that can occur following such events. Prior research has shown that there are instances where individuals grow as a result of their stressful experiences. Some individuals find that they are stronger than they previously realized, or identify new life opportunities that were not visible before the event. Other individuals find that the stressful experience leads them to developing closer relationships with others, or even establishing a new-found appreciation for life. We are interested to know how often positive changes occur, how the changes unfold over time, and how they compare to changes following significant events that are not as stressful.

For those of you who have experienced profoundly upsetting events, you may find that having shared your experience in this study brings you some benefits. Previous research has shown that writing or talking about upsetting events in studies like this is associated with improved physical and emotional well-being for many people.

Should you want to further discuss anything you have experienced and how it affects you, including the experiences that you have described in this research, Brock University offers confidential, personal counselling that is free of charge. This service is located in the Schmon Tower (ST400), and is available by appointment Monday to Friday 8:30am to 4:30pm. The contact information for this service is on the attached sheet as well as a list of local services.

If you have any questions about the research please feel free to contact us. Our contact information is listed below as well as on the copy of the consent form that is also included with this letter.

Thank you again for sharing your experiences. Not only may it be beneficial for your own well-being, but it will also contribute to and expand our knowledge about the effects of stressful experiences.

Tina Hardman, th06om@brocku.ca
Kathryn Belicki, kbelicki@brocku.ca

Resources for Counselling

If you are in PSYC 1F90 or 1F25 you may have seen a copy of these resources in your course manual. If you or someone you know would like to talk about an upsetting experience, these resources are both private and confidential.

The inside of every Bell phone book lists emergency and crisis numbers, including those for phone help lines, women's centres, sexual assault centres, etc.

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Niagara Region Sexual Assault Centre	**905-682-4584**
Women's Place (St. Catharines)	**905-684-8331**

To see a Counsellor, here are some local resources:

Brock University Personal Counselling Services	**905-688-5550**
	Ext 4750 (to book an appointment)
	Ext 3240 (in a crisis situation)
St. Catharines General Hospital	
Mental Health Outpatient	**905-684-7271, Ext. 46440**
Sexual Assault Treatment	**905-684-7271, Ext. 45300**

The Yellow Pages list many other psychotherapists with varying training and area of specialty, and also lists some of the major resources for community support and self-help support. There are a number of categories in the Yellow Pages that are relevant. If you look under "Counselling Services" you will find a list of the various categories. If you would like to see a registered psychologist in private practice, most are listed in the Yellow Pages under "Psychologists".

In addition, depending on your circumstance(s) the following may be relevant to you….

Are you concerned that a child is being abused?

Contact the Family and Children's Services office in the area the child lives.

In Niagara, the number is **905-937-7731.**

Is it an emergency (i.e., you have good reason to believe that someone is about to hurt or kill themselves or another)?

If the person will listen to you, persuade them to:

1) call their psychotherapist, if they are already in counselling, or psychiatrist if they are under the care of a psychiatrist, or

2) go see their family physician immediately (during office hours) or

3) go to the Emergency room of a hospital.

In the case of seeing their family physician or going to Emergency, if possible, go with them. Sometimes in these contexts, one has to be persuasive about the severity of the crisis, and the hurting individual may not be in a position to advocate for themselves in this way. If they will not take your advice, call the police. Be prepared to explain in detail why you are concerned. The police have the authority to take a person to a hospital for observation, but will only do this if you are able to convince them there is a real risk for injury. However, even if you are unable to convince them, at least you will know that you have done what you could.

Appendix X

Reminder Message to Participants For Time 1

Dear Participant,

You have received this email because you are signed up for the study 'Life Changes During Early Adulthood'. This is a reminder that you had recently received a link to complete part 1 of the study; however, you have yet to complete the survey. If you would like to complete the survey but do not have the link, please send me an email and I will send a new link to your Brock email account. If you wish to discontinue your participation in the study, please respond to this email, and I will send you a copy of the consent form and debriefing letter that has a list of counselling services.

Please do not hesitate to contact me should you have any questions.

Best,
TinaMarie (th06om@brocku.ca)

Appendix Y

Reminder Message to Participants For Time 2

Dear Participant,

You have received this email because you are signed up for the study 'Life Changes During Early Adulthood'. This is a reminder that you had recently received a link to complete part 2 of the study; however, you have yet to complete the survey. If you would like to complete the survey but do not have the link, please send me an email and I will send a new link to your Brock email account. If you wish to discontinue your participation in the study, please respond to this email, and I will send you a copy of the consent form and debriefing letter that has a list of counselling services.

Please do not hesitate to contact me should you have any questions.

Best,
TinaMarie (th06om@brocku.ca)

Appendix Z

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Study Name	# Life Changes During Early Adulthood
2-Part Study	This is a 2-part study. Both parts should be scheduled at the same time, and the second part should be scheduled to occur 60 day(s) after the first part.
Abstract	RECEIVE 2 HOURS OF COURSE CREDIT - Online Study - Sign up for any time slot because you will receive a link in your Brock email within 72 hours of signing up that will give you access to the survey!
Description	Must be between 17 - 25 years of age and either: 1. have had a profoundly upsetting or traumatic experience at least 2 months ago, but no more than 2 years ago, OR 2. have never had such upsetting experiences Participation in this study will take place online using your own computer or laptop. Participants will receive an electronic link to their student email address within 72 hours of their sign-up, and they will have 3 days to complete the questionnaires. This is a two-part study with a 2-month interval between sessions, with the first session requiring less than 1 hour to complete. Two months following the participants' initial participation, a second link will be sent to the participant's student email address for the second session, which will require less than 1 hour to complete. Participants will receive one hour of participation credit for each session, for a total of 2 course credits. Participants will be asked to briefly describe a significant event that has happened at least two months ago but no more than two years ago, and then answer questions about how that event has affected them both positively and negatively, as relevant). For those who are in the group that has experienced a profoundly upsetting experience in the past 2-24 months, we will ask that they focus on that event. Data collection will involve completing questionnaires privately and confidentially, using the participant's own computer or laptop. Note: If you are a student in PSYC 1F90 or 1F25, one of the investigators is your professor. We want to assure you that there is no penalty associated with your decision to participate or to not participate in this study. For example, your decision will not affect your status in the course. For courses that accept research participation for course credit, 1 hour course credit for each session, for a total of 2 hours. Participants who withdraw from the study may not be eligible for the entire 1-2 hours of course credit. Only course credit is available as compensation for this study.
Eligibility Requirements	Must be between 17 - 25 years of age and either (1) have had a profoundly upsetting or traumatic experience at least 2 months ago, but no more than 2 years ago OR (2) have never had such upsetting experiences
Duration	60 minutes (Part 1) 60 minutes (Part 2)
credits	1 credits (Part 1) 1 credits (Part 2) (2 credits total)
Researchers	Kathy Belicki

	Email: kbelicki@brocku.ca Tina Hardman Office: 5456 Phone: 9057355957 Email: th06om@brocku.ca Researchers may be assigned to a specific timeslot
Study Status	Visible to participants (approved) Active study (appears on list of available studies)
REB Approval Code	13-058 (expires November 28, 2014)

Appendix AA

Study Instructions

The following are the specific instructions that participants saw:

Message About Survey's Forward Button Message

Please Note: You will NOT be able to return to a previous questionnaire once you have "clicked" the >> forward button. Please ensure you are ready to proceed onto the next questionnaire before clicking the >> forward button.

Ineligible Response With Option To Complete Survey

Based on your response, you are not eligible to participate in this study. Therefore, we cannot use your data in our analyses. However, if you would like to complete the questionnaires for your own experience, you will receive 1 hour of course credit. If you choose not to continue with participating in this study, you will receive 15 minutes of course credit. Would you like to complete the measures, even though your data cannot be used in our analyses?

- ○ Yes
- ○ No

Message Intended to Increase Salience of Experience

Now think back to the experience you just described, and think about that experience as you complete the next set of questionnaires.